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More Failures of Foundations and of Superstructures.

IN the closing week of 1882 our attention was forcibly called to those dangers to which structures of any considerable magnitude are exposed, owing to artificial subterranean disturbance, at a depth below that to which the attention of the architect is usually directed in dealing with his foundations. During the opening week of 1883 an echo of scarcely less loud a warning has been heard, with reference to dangers more patent on the surface of the ground, and especially due to those changes in clay soils which may be effected by the course of the seasons, and to which buildings are more particularly exposed in the case of any new earthwork being executed in their vicinity.

Of these demands for the consideration of the architect by no means the least important is furnished by the report of Col. Yolland, of the Royal Engineers, to the secretary of the Railway Department of the Board of Trade, on the particulars of the fall of a railway bridge on the London, Chatham, and Dover Railway, between Bromley and Bickley stations, by which seven out of eight workmen, who had taken shelter in a hut inside the southernmost arch of the bridge in question, were suddenly killed. The report professes to deal with the cause of the accident; and while this is a circumstance on which those engaged on structural works are to be congratulated, the lesson pointed by the catastrophe is one that much deserves attention.

The failure of the Ivy Bridge, the inspector of the Board of Trade states, was due to the subsidence of the north pier. It is not quite intelligible what the reporter means by saying "the base of the pier appeared to have passed through the footings on to soft yellow clay"; but we conclude the meaning is that the footings were laid on a structure of this clay, overlying the blue clay. Without speaking too positively as to the precise geological age of the deposits in question, we are aware, from personal experience, of the existence in this part of Kent of an extremely treacherous yellow clay, often mixed with the *débris* of shells, which will stand at hardly any slope, and with which it is extremely difficult to deal. A large cutting on the South-Eastern Railway, near New Cross, long gave excessive trouble from the presence of this material; and on the Gravesend and Rochester Railway, in a small cutting of less than 10 ft. deep, the occurrence of this shell-bearing clay rendered necessary an amount of excavation, wholly disproportionate to the depth of the cutting. In the case of Ivy Bridge it appears to be the opinion of the inspector of the Board of Trade that this layer of yellow clay acted as a lubricant, allowing the pier to move laterally to the north about 12 in., while at the same time sinking vertically about 1 ft. 2 in. Our own experience of similar soils leads us to regard this opinion as highly probable. The important question, however, here arises, "how long a time did this squeezing and sliding process occupy?" As to this, it is desirable to have all the information that can be collected. Col. Yolland's report would seem to point to the movement as comparatively recent, and as not unobserved. But as a question of public safety, the notation of the length of warning that is given by any structure sliding or tottering to a fall is of primary importance. On this we had occasion to remark as to the fall of the Bradford chimney. It is of the utmost importance to all architects or persons occupying, or having charge of buildings erected on treacherous soils, to have the fullest information that can be collected as to the length of warning that is given of disasters.

Col. Yolland thinks it probable that "the subsidence of the north pier, after having stood for twenty-four years without exibiting any weakness of any kind, may have been facilitated by the removal of the earth under the north arch, and that the water, during a somewhat wet season, had passed down to the clay under that arch, softened it, and permitted the clay to be pushed upward, lifting up the rails of the gas-works siding to the extent of about 4 in., and allowing the north pier to settle down and then slide towards the north." The only hesitation that we feel in accepting this view is due to the consideration of the impervious character of clay. The surface of clay is only to a certain extent absorbent, and becomes softer and more slippery from rain; but unless that be "poached" or puddled into the mass below by the feet of horses or other means, the clay itself acts as a lute to keep the water from sinking in. In fact, that is the main difference between the pervious and the impervious soils of the geologist.

It is conceivable that if any passage that might act as a funnel was unintentionally formed, the rain might penetrate between the yellow and the blue clay, thus facilitating the sliding of the former, with everything that it supported, on the latter. But the usual semi-fluid character of the yellow clay is enough to account for movement, even without any additional dose of water; and we are more disposed to look to the removal of earth which had acted as a counterbalance-weight, than to any other cause, for the commencement of the movement that resulted in the fall of the pier. Experience has shown how slight a matter may turn the scale of a balance. No one who had not investigated the subject would have anticipated that so slight an addition to the load borne by the girders of a railway bridge as was caused by the spreading of 2 in. or 3 in. of gravel over the roadway, would be enough to make all the difference between safety and destruction. Yet it came out clearly on the inquest on the persons killed by the falling of the Dee Bridge, at Chester, in 1847, that it was to this very cause that the catastrophe was due. The factor of safety in the structure was far more closely approached than the engineer was aware, and the additional tons of material, which came to more than the platelayers in any way thought about, so strained the power of resistance that the first succeeding train broke down the main girders. We should like to know the cubic quantity and weight of earth that had been removed,—for the purpose, as we understand, of widening the line,—in the present case. Whether our theory be right or not, it is highly important to have all the facts, among which those determining the dates of the movement are not the least important.

Very different in its geological circumstances was the failure of the retaining wall at the Vriog cutting, on the Dolgelly Railway, near Barmouth, on the evening of the 1st current. There the line of railway, so far from lying on soft clay, runs along the face of a cliff, some 50 ft. or 60 ft. above the sea. Above the railway, again, is the turnpike-road, sustained by walling, which is said to have been loosened by the late heavy rains. The spot had been passed by a watchman not long previously to the passage of the train, when all was clear; and it was conjectured that it was the vibration caused by the train itself that finally brought down a portion of this wall. At all events, the engine came upon a mass of *débris* which precipitated it, together with the tender, on to the beach below.

It would be unsafe to speak with any decision without a visit to the spot; but it may be well here to remark that, as a general rule, the fall of retaining walls is due to the omission of proper weep-holes. The scarp of a rock, supported by a retaining-wall, may either be drained, at the same time that it is protected from the action of the atmosphere, by its revetment, or it may be allowed to become the background of a thin vertical sheet of water, held up by the masonry. In the latter case, a little addition to the height of the column, such as may be caused by heavy rain, may be enough either to overthrow the wall, or so far to balance

its equipoise that the vibration of a train will be destructive. Whether this was, or was not, the case in the Vriog cutting we trust the inquest will make plain. In all cases of the fall of buildings that have stood for years there must be a cause, and the interest of architecture demands that the cause, in every case, be made plain. Things do not tumble of themselves, nor is time alone an element of overthrow.

This remark very forcibly applies to another case of failure, in a building that has stood for upwards of five centuries. "Several large gaps," the morning papers announce, "have, during the past few days, shown themselves in the great central tower of Peterborough Cathedral." It is added that Mr. Pearson, when called in, declared the tower to be unsafe, and that the Dean and Chapter have given orders to have it taken down. It is a matter of much interest to ascertain the cause of so serious a failure. The fall of a spire may be due to the decay of wood-work; but in a stone tower there seems to be no room for decay. In the case,—which will be in the recollection of our readers, and as to which we laid before them the result of personal examination on the spot,—of the ancient tower of St. Alban's Abbey, the excellence of the work of the old church-builders was exhibited in an unmistakable manner. The movement in the tower of St. Alban's Abbey, which, but for the prompt and efficacious measures taken for its arrest, would have resulted, in a few hours, in the fall, not only of the tower, but also certainly of the north transept, and probably of a considerable part of the chancel of the church, was due to the unscrupulous manner in which holes had been hewed out from the very piers of the tower itself for the construction of tombs. It will be important to ascertain whether any similar liberties have been taken at Peterborough.

It will be also important to know the geological facts of the case. Peterborough stands on the very edge of the Fens; but as to what stratum directly underlies the abbey we are unaware. Æthelred is said to have obtained from Pope Agatho extraordinary privileges for the Abbey of Medeshampstead in 680, by which it was raised to the privileges of a vice-Papal see, — pilgrimages to the church of St. Peter in this monastery being allowed, for certain reasons, to be equivalent to a pilgrimage to Rome itself. Its abbot was summoned to Parliament in 1538. The last abbot, John Chambers, was consecrated bishop of the new see of Peterborough in 1541 or 1542. A copper coin, or token, exists, which bears two swords crossed, between three crosslets, on the obverse; and the legend, "The overseer's halfpenny of Peterborough, 1669," on the reverse. But these are not the arms of the see of Peterborough, which are "gules, two keys crossed in saltire, or, between four cross crosslets fitchy." (The latter are shown sable in the peerage we consulted, but this would be false heraldry). The town is said to be naturally very badly off for water, the supply being taken chiefly from shallow wells. We refer to this not as regards any action taken under an Act passed in 1876 for obtaining a supply of water from Wilsthorpe, in the county of Lincoln, eleven miles distant, and the opening of new springs under the powers of that Act, but as serving to indicate that the town, and thus possibly the cathedral, are most probably situate on the palæolithic gravel of the valley of the Nene. At all events, why a tower founded in 1350 should suddenly give warning of decay in 1883, is one of those phenomena the clear explanation of which is a debt due to Architecture herself.

The architect cannot be too much on his guard against the treacherous character of clay as a foundation. Under that common title are comprised, indeed, a large variety of strata, of different physical characters as well as of different geological ages. But the difference between the plastic clays of the tertiary and post-tertiary epochs, and the clay slates of the Laurentian deposits, is mainly a difference in consolidation. Heavy pressure for long periods of time has driven the water not only from its mechanical mixture, but, it may be thought, from its chemical alliance with the alumina of the ancient rocks. Thus what was once a series of annual deposits of lake or river mud has become compressed and solidified into a form resembling the leaves of a book when those leaves have become adherent to one another. And so much have these leaves become altered in texture in this secular press that they are actually employed as the covering of roofs, to turn off water, which they no longer absorb. Between the Welsh clay slate, however, and the Kentish yellow clay there is an indefinite series of beds, distinguished from each other by more or less hardness, compactness, and dryness. The London clay at some depth requires the use of the pick to make any serious cutting in its substance, although the soft rock, which is its true character, may show little or no signs of stratification. The Oxford clay, again, which also requires the use of the pick, comes out in cakes or plates, very distinctly stratified, often marked in the beds with glittering ammonites, of golden aspect, and capable of resisting exposure to the weather for some years before it returns to mud under heavy rain. The "Rab" of Pembrokeshire, which resembles the "killas" of Cornwall, is an indurated and stratified clay, which breaks into small nodules almost like those into which serpentine divides. These are sufficiently baked by nature to form excellent footpaths. Some beds form very fair horse roads, although under the action of wheels they are not long in returning to mud. The varying, but usually abominable, character of the roads in Pembrokeshire is due to the use of rab, poverty being as usual a bad economist, and the avoidance of the first cost of stone metalling entailing a far greater expense on the owners of vehicles that frequent the cheaply-covered roads. In parts of Pembrokeshire, again, clay slate is used for road metal, with much the same results as the hardest rab.

With the use of these naturally indurated clays may be compared that of brickbats, clinkers, and burned clay. We have experience of the manufacture and use of the last material in many parts of England, especially on some sections of the Midland Railway, as ballast. It is, all things considered, perhaps the worst ballast anywhere used. If well burned, it forms, in the first instance, an admirable bed for the sleepers. But it at once commences a process of disintegration, which the use of the platelayers' beaters hastens. It first becomes sticky, then ceases to drain water through its interstices, and finally returns to mud. Broken bricks behave much in the same way, their power of resisting disintegration varying with the degree of burning, as well as, to some extent, with the nature of the clay. Even clinker-burned bricks are not absolutely reliable as material for roads, though the true clinker, or slag from iron and lead works, forms an admirable road metal.

Such being the unreliable character of clay when exposed to atmospheric influences, even where, by natural or artificial means, it has been to a very great extent deprived of water, and indurated accordingly, it is obviously of no small importance to the architect to collect any instances of the behaviour of this geological rock *in situ*, especially when exposed to any change of pressure or of exposure. As to this, the railway works of the past half-century, and the sewerage and tunnel works of London and the Thames valley, afford some very important data.

When the London and Birmingham Railway was commenced, Mr. Robert Stephenson adopted an ellipsoidal cross section for his tunnels, which were all provided with brick inverts. The Watford tunnel penetrated such solid chalk that the late Sir Charles Fox, who was resident on that contract, suggested the omission of the invert, and that the side walls of the tunnel, instead of resting on a stone skewback, which formed the abutment of the invert, should be built with the footings usual to a wall of curved batter. Mr. Stephenson approved this suggestion, which effected a saving of more than 3*l*. per yard run of the tunnel, and this important work was executed accordingly, with complete success.

The economy thus attained at Watford stimulated Mr. Birkenshaw, then resident on the Camden Town contract, to propose the adoption of the section without invert for the Primrose-hill tunnel. The structure was accordingly commenced on this plan. But it had not proceeded very far when it became evident that what miners call "creep" was going on. The bottom of the excavation rose, under the pressure of the superincumbent mass. And it soon became clear that if the tunnel were made without an invert, the time would not be long before it would become wholly impassable; in part from the rising of the floor, and in part from the squeezing inward of the sides. In fact, the whole mass of clay that forms Primrose-hill, hard as it was to the touch, and requiring the use of the pick for its excavation, is proved by the experience of this tunnel to be a true semi-fluid; slow, no doubt, in the motion of its particles, but moving with all the force due to the weight of the mass above the point under trial.

If any doubt be entertained as to the accuracy of the statement that London clay, although apparently solid, and so hard as to require the use of the pick in excavation, acts with the slow but formidable force of a true semi-fluid, the statement may be supported by the experience of the small footway-tunnel under the Thames at Tower-hill. It is much to be desired that there should be published a full account of that ingenious and successful work. We speak of it from memory, having visited it during progress, but we believe that the wish for a good description of its detail has long since been expressed by the secretary of the Institution of Civil Engineers.

The little tunnel in question was essentially a 6-ft. or 7-ft. driftway, bored through the London clay. It avoided the enormous expenditure incurred by its precursor, the original Thames Tunnel, by being laid out at a depth that allowed of this natural protection from the inburst of the river. A circular shield, as far as we remember, was used in the front of the works, the miners cutting out the clay, a portion at a time, in advance of the shield, which was then pushed forward, and the space which it had occupied filled up by wrought-iron tubing, in, we think, three segments, to form the permanent sides of the bore. Through holes in these plates grout was forced, so as to fill up the interstices between the outside of the plates and the inside of the excavation. To this, which we regarded first as useless, and secondly, as positively objectionable, as bringing lime into contact with wrought-iron plates, we have before demurred; but with this one exception the whole conduct of the undertaking was remarkably skilful and happy. We may add that the use of the electric telegraph facilitated the progress of the work in a degree that no one who had not the practical experience of running long headings without this appliance can realise.

But the point of interest to our present inquiry is this:—The shield was advanced with but slight pressure into the excavation prepared for it. But when the work was suspended for two or three shifts (as for Sundays, for example), the difficulty of moving the shield became greater, and that in proportion to the delay. It was quite conceivable that if this structure had been left alone for a certain time it would have become immovable, or at least have broken before it could have been pushed forward as a whole. This was due to precisely the same semi-fluid action of the clay as at Primrose-hill, and although in one case the geological rock in question was below the river, and in the other well above water level, besides being massed in a form likely to throw off water as much as possible, the action was identical. As to the rapidity of action, indeed, in the two cases, we cannot speak with certitude. It may have been greater under the Thames than above it; but we are by no means clear that such was the case. But that in both cases a slow steady movement of the particles of the clay to fill up the hole that had been cut through it took place, and that it did so with the force of semi-fluid action, is a positive fact. And it is one, we may add, of which it is of great importance for all those who build on this stratum to be fully aware.

In those costly works which have been executed on the Northern and Western lines from London, and which are now in course of execution on the South-Western and some other lines, modification of the original cross section of the cuttings is not unusual. In some, the bottom of the slope is replaced by brickwork; in some, by a concrete wall. The three-arched bridges are underpinned, and a double width for the line is attained as cheaply as may be. Now, in any case where pressure on the London clay is seriously modified by these works, the greatest vigilance should be exercised. We do not by any means assert that the fall of the Ivy Bridge was due to the removal of pressure, and the disturbance of counterpoise. We should decline to commit ourselves to a positive expression of opinion on the subject, under any circumstances, without being professionally asked to do so.

And, in point of fact, we have not inspected the spot.

But we think it will become apparent, from the experience above detailed, that the cause of the movement is more likely to have lain in the disturbance of equipoise than in any infiltration of water under a pier that had stood for more than twenty years. And whether that be the case or not, we are sure that the subject is one demanding the very serious attention of professional men.

We may, indeed, add to the proofs which we have before cited of the slow but sure movement of apparently solid London clay an illustration within the knowledge of every reader. Who has not looked, with distaste if not with wonder, at the large cast-iron arched girders that span, at frequent intervals, the open cutting between Euston and Camden-town stations? To what is the presence of those ugly struts due? The answer is, to the creep of the London clay. The retaining-walls through this cutting were built with the utmost care, and on the most approved section, in 1835. They are founded on a layer of 2 ft. of concrete, and the bottom of that layer, being laid out at right angles to a tangent to the outer curve of the wall at the spot, was expected to act as an abutment, and to bear up the retaining-wall against any thrust due to any movement of the clay behind it. And so, for some time no doubt, the work stood. We are not now aware of the date of the insertion of the struts, of the character of the menace which led to their introduction, or whether the distance between the walls was found to be diminishing, or the balance line of the railway to be rising. But having given details with which we are personally familiar, we point to those others which are beyond our own actual knowledge, but of which the facts are patent to all the world, while their history, if accessible, will be found to afford a fresh proof of the treacherous and unstable character of foundations on London clay, when the equipoise which has subsisted for centuries is disturbed by the work of man.

CHRIST CHURCH CATHEDRAL, DUBLIN.

THE splendid volume giving an account of the restoration of Christ Church Cathedral, Dublin,* is of interest for more reasons than one. It includes a history of what is known of the building and establishment connected with it from the earliest time, by Mr. Seymour, the precentor of the cathedral, and an account of the whole process of restoration, the state in which the building was and that to which it has been brought, written by Mr. Street, who undertook to complete this portion of the work on the death of Mr. R. J. King, who had been occupied on it; and this essay was the last writing which Mr. Street produced on a professional subject, it having been, in fact, completed only a few days before his death. The essay is not only interesting for the account which it gives of the gradual progress made in tracing out as far as possible the original design of the building, but also for the full expression of the writer's views in regard to the principle of restoration and the much-argued question of the manner in which Mediæval buildings were carried out, and the degree of individual freedom allowed to the workmen, on which latter head Mr. Street's sober and considerate remarks are well worth the careful attention of some of those sentimental enthusiasts who think that Mediæval cathedrals arose spontaneously by the inspiration of the workmen. The account is profusely illustrated by engravings, two of which we are enabled to reproduce in this number of the *Builder*, and the binding, paper, and printing are of the most sumptuous description. This high finish in the production of the book has been adopted, in part because it was desired to make it a memorial volume to the memory of Mr. Street, as well as a memorial of the munificence of Mr. Roe, who bore the whole expense of the restoration. As a formal recognition of his claims to be remembered, the volume opens with a dedicatory preface to him, written by Sir Theodore Martin. Portraits of Mr. Roe, of the Lord Primate, and of the Archbishop of Dublin are introduced; that of Mr. Street might well have been added; the want of it seems the only deficiency in the book.

We have not space to dwell specially on Mr. Seymour's historical chapter. It records the probable founding of the original cathedral, of which only a few bits of carved stone are now remaining, by Sitricus or Sitric, king of Dublin, who, about 1038, "gave to the blessed Trinity and to Donat, first bishop of Dublin, a place on which to build a church of the blessed Trinity"; it appears to have been originally a secular foundation, but established as a monastic one a little later than the middle of the twelfth century. The church was then apparently rebuilt as a priory church, with a short choir with an apsidal termination. At the beginning of the fourteenth century the steeple was blown down, and towards the middle of the same century the choir was rebuilt on a long and narrow plan, probably much inferior in effect, even in its best days, to the original choir. Henry VIII. dissolved the Priory, and established a Dean and Chapter and constituted it a cathedral foundation. In 1562 the vault pushed out the walls of the nave, and fell in, carrying away also the west front. "The southern arcade was replaced in that same year by a hideous blank wall, and the stone-groined roof by mean and naked rafters." Subsequently the spire had to be taken down, the tower showing symptoms of inability to bear the weight. It is not till the beginning of the seventeenth century that anything definite is heard about the reinstating of the fallen portion; Archbishop Jones rebuilt a part of the church which had lately fallen, and repaired the steeple, placing also three vanes on it. The state to which the building was reduced in 1633 is graphically indicated in a quotation from a letter from Archbishop Bramhall to Laud. After describing the generally ruinous condition of the churches of Ireland, he adds, "In Christ Church, the principal church in Ireland, whither the Lord Deputy and Council repair every Sunday, the vaults from one end of the minster to the other are made into tippling-rooms for beer, wine, and tobacco, demised all to Popish recusants, and by them and others so much frequented in time of divine service, that though there is no danger of blowing up the assembly above their heads, yet there is of poisoning them with the fumes. The table used for the administration of the blessed Sacrament, in the midst of the choir, is made an ordinary seat for maids and apprentices." During Strafford's administration, a public order was made prohibiting such practices, and enjoining the removal of all such houses and buildings as had been erected against the walls of the church so as to stop up light, endanger the fabric, "or any way annoy the said church." Little, however, was done towards getting the fabric into a better state till the end of the century, when some repairs were made under the direction of the then Dean and Chapter. An incident in the history of the cathedral, shortly after this, was the purchase of a portion of Renatus Harris's organ, which was built in rivalry with one of Smith's for the Temple Church. Smith's was finally chosen for the Temple, and the Christ Church people bought a part of Harris's, which they subsequently parted with, for no sufficient reason, to the parish of Wolverhampton. The cathedral is thus connected with a very celebrated musical controversy, for such that between the adherents of the two rival organ-builders was. Another musical incident in its history is the fact of the assistance of the cathedral choir, in 1762, in the first performance of the "Messiah," which Handel undertook in Dublin, on the special condition of the assistance of the Christ Church choir, which seems to have preserved its status and repute throughout all the architectural vicissitudes of the establishment.

At the commencement of the present century the then Dean and Chapter endeavoured to call public attention to the dilapidated state of the Cathedral, and memorialised the Lord Lieutenant on the subject, but with no avail. Nothing more seems to have been attempted till the accession of Archbishop Trench in 1864, whose sympathy in the matter strengthened the hands of those who wished to restore the cathedral, and led to one definite step, the engagement of Mr. Street to examine and report upon the state of the cathedral. His report did a good deal to awaken public interest in the subject, but no means for acting upon it were available, and in 1871 the Irish Church Act operated to dissolve the capitular body and deprive Christ Church of its endowments. When, as Mr. Seymour says with somewhat amusing *naïveté*, "every earthly prop was thus removed," there came unexpectedly the generous and public-spirited offer of Mr. Henry Roe to restore the building at his own sole cost; and, without regarding this assistance as superhuman, as Mr. Seymour's words would seem to imply, it is an instance of liberality worthy of the highest recognition.

We have thought it worth while to run through the main points in the historic account, as the scale and cost of the book will render it unattainable by any but a minority of the public. The real interest of the volume from our point of view consists, however, in the narrative by Mr. Street of his method of dealing with the cathedral; which is not only interesting as to facts, but includes some general criticisms on the whole subject of the treatment of old buildings. It must be premised that for the most part the work at Christ Church was literally a "restoration" of what had almost entirely disappeared. It was not a restoration in the sense in which the word is more commonly understood, and which implies the repairing and re-instating of details that have decayed, the removal of the lumber of various ages, and the cleaning of the stonework, &c. These usual branches of work in a cathedral restoration imply that the main portion of the architecture is there in a recognisable form, though decayed and dilapidated. But in Christ Church Cathedral the case was worse. The old building for the most part might be said to have practically disappeared, and the problem really was to rebuild it as nearly as possible in its original form, from the information which could be obtained from a few scattered fragments, a pier here and an arch there, which were left sufficiently complete to furnish the main data for renewing the design. Part of the description of the state in which the building was may be quoted:—

"In 1871, before the work of restoration or rebuilding was commenced, the Cathedral of the Holy Trinity, or Christchurch, was a cruciform church, with a nave and north aisle of six bays, and a long choir, with north and south aisles extending about half its length. The site of the old south aisle of the nave was occupied by a library, a chapter-room, a robing-room for the choir, and a lobby leading to the sexton's house, which was attached to the south-west portion of the nave. On the south side of the choir was a modern entrance, with a vestry or waiting-room attached; whilst, on its north side were a decayed room, and a house which occupied the site of an old Lady-chapel. Over the intersection of the transepts, nave, and choir,—supported upon arches rudely wrought in limestone and covered with whitewash,—rose the central tower, solidly built, but mean and bad in all its details, both inside and out. The only portions of the church in which there was anything to interest an architectural enthusiast were the two transepts, the north arcade and wall of the nave, and the two western arches of the choir. The transepts had but one old external feature,—the south doorway, forming the principal entrance to the cathedral,—and inside they had been much defaced with whitewash, and finally ceiled with lath-and-plaster vaults of the meanest kind possible. The northern nave wall was in a dangerous state. The columns, built of small pieces of freestone, with a core of limestone rubble, were cracked and bulging in all directions. The triforium and clearstory were much out of the perpendicular, and had no doubt given way before the 3rd of April, 1562, on which day the groining of the nave fell, bringing with it the whole of the south arcade, with the clearstory and triforium which it carried. The groining of the north aisle of the nave had also fallen, presumably about the same time, and the whole north wall of this aisle, being dangerously out of the perpendicular, had been propped by an enormous mass of masonry built up against it from the outside, and inclined like a vast continuous buttress against its whole length, blocking up, while it fortunately preserved, the old windows and other remains, of which more will have to be said hereafter."

The south wall of the nave, which is described in more detail than we can follow out here, appears to have been one of the instances, occasionally met with, of the attempt to imitate Gothic work at a late period; it bore an inscription dating its building as 1562, and presented the appearance of having been built up partly with old stones taken from other buildings connected with the cathedral, preserving the pointed arch and a certain amount of true Gothic detail oddly assorted. But Mr. Street decided that it could not be regarded as of sufficient interest to justify the retention of it in rebuilding the cathedral. Externally there

* The Cathedral of the Holy Trinity, commonly called Christ Church Cathedral, Dublin: an Account of the Restoration of the Fabric, by George Edmund Street, R.A. With an Historical Sketch of the Cathedral by Edward Seymour, M.A., and a Dedication by Sir Theodore Martin, K.C.B., LL.D. London: Sutton Sharpe & Co. 1882.

was hardly a single old wrought stone left, and no feature of any architectural value or beauty, and "the most conservative of antiquaries could not have felt a single pang" at hearing that the exterior was to be entirely renewed. Mr. Street, perhaps, did not fully realise how far the most "conservative of antiquaries" in these days is prepared to go; but the statement sums up clearly his judgment as to the value of what remained of the exterior of the cathedral.

The state of things thus described justifies the conclusion expressed by Mr. Street, that whatever scruples may exist in ordinary cases as to restoring old buildings, it would have been hard to find any plea for retaining Christ Church Cathedral in its late unrestored state. The donor of the funds was, indeed, most anxious that not an ancient stone which could be retained in its place should be removed, a feeling with which Mr. Street was entirely in accord. But in reference to the general question of restoration, Mr. Street here leaves on record an answer to the objection which we now so constantly hear, that it is impossible to restore an ancient building, because each age marks its own impress on everything which it does. He points out that every building has been the work of a number of men under the direction of a very few, or of one man only in many cases. "No feature, for example, is more important, or more affects the general effect of a building, than the great moulded plinth, which, as in the Yorkshire abbeys, forms the base to an entire fabric. Yet this base must have been designed by one man at once, in the space of at most a few minutes,—whether marked on a stone or drawn on a sheet of paper matters not at all,—and then its execution may have occupied a gang of workmen for weeks or months. All these workmen had to work the moulding drawn, on certain uniform conditions, of the same material and with the same tools, so as to leave no room whatever for the indulgence of any of the personal tastes or fancies of individual workmen. What is true of the plinth is true of almost every other portion of the truly architectural features of the building. Yet the combination of these strictly architectural features in one whole is no less the work of one mind and one hand than was the first section of the first moulding. The mere workman of the thirteenth century was in no respect whatever superior to the mere workman of the nineteenth century. He confined himself to doing what he was told, implicitly following the directions of his master." An illustration of another kind is adduced, in the fact of the bad building of the piers at Christ Church, all with small pieces of stone casing, with no bond, and filled in with rubble. Of the two or three dozen masons who did the work, one or two at least must have known that this was not the way to do sound work. But they, like the modern workman, threw off the responsibility, and worked as they were ordered, with no more originality in their individual work than so many workmen of the present day. We commend this practical piece of argument, derived from the incontrovertible facts of the case, to those who think the Mediæval cathedrals grew spontaneously. The fact that a building is 500 years old is an increased reason for feeling, as Mr. Street says, love and respect for its very stones. But it is quite possible to build a repetition of it so that it shall have the very effect which the original had when first built. It was the design of one man, carried out by workmen acting under his orders, just as in the practice of the present day. There might have been less of drawing, more of oral instruction to the workmen, illustrated on the spot by as much drawing as was necessary, but the relation between them and the superintending mind (by whatever title he may have been known) was essentially the same as it must always have been, for any systematic design to be carried out.

But there may be, on this basis, a question as to whether the principle adopted by Mr. Street in the restoration of Christ Church Cathedral was altogether the best, or at least whether it was the only right one. Only a few scattered bits of the original work were left from which the original design could be inferred. His principle was, as that of most restoring architects just now would be, to make the most of these as guides, and to "restore" what he conceived, from these data, the original edifice to have been. This appears to us to be more a question of circumstances than it is generally admitted to be. Where there is one pier of an arcade left in tolerable repair, so that there is no necessity to remove it, then it follows, as a matter of course, that the restoration of the other piers, even if the original work has entirely disappeared, will follow the pattern given by the remaining one. But when it is a question of only probable conjecture, assisted by a few stones which give a probable but no certain indication, then we cannot see that the architect is necessarily bound to follow these in rebuilding. In the former case he can say with certainty, "This is the old design, though carried out afresh for the most part with new materials." In the latter case he can only say, "The details and general arrangement must have been something like this"; he can only get as far as general probability. Now, so far as the interest of the matter is to consist in the historical value of the design, probabilities are worth little or nothing. In such a case certainties alone have historical value; and where certainty is out of the question it becomes in reality a matter of erecting a new building on the site of the old one, and the business of the architect is to make the best design he can suitably to the nature of the case and the requirements of the building. It is not worth while in such a case to execute an inferior design or inferior details, because they, or something like them, were probably there before. If such probabilities lead to the production of a poor effect in the general design or the details, inferior to what the restoring architect knows how to produce if left at liberty to exercise his own taste, he had better exercise his own taste and do the very best he can, rather than restrict himself to inferior precedents, which are only matter of doubt, or of probability at best. Taking the whole account of the restoration of Christ Church Cathedral, there seems rather too much made of the idea that the old cathedral has been literally "restored" to its owners. This cannot be, nor do we see that it was worth while to go out of the way to insist upon this view of the matter. The old building had practically nearly disappeared, and the Synod (which is now the title of the governing body) have a new Gothic cathedral by an architect exceptionally qualified for that kind of task, in which some of the old features have been literally reproduced, and in which it seems probable that the general design and character of the original are more or less represented. But the historical value of great portion of the building must now be, after all, very slight, and the question still remains, how much superior a building Mr. Street might have produced if he had held himself more loose from merely probable precedents, and evolved the finest phase of Gothic architecture which he had been able to produce, even with the introduction of some absolute novelty of detail, so far as that would have been in keeping with the few actual remains of the old detail.

The account of the manner in which some of the former design was recovered is, however, very interesting. In regard to the plan, the first indication was furnished by the crypt, which preserved the old apsidal termination of the east end. The choir before the restoration was a long narrow compartment, which, in reality, ran through the former east window and took in the space originally belonging to the Lady-chapel. An arch, with Transitional ornamentation, built into one wall of the choir, proved to be the original arch enclosing the east window in the central compartment of the apse; and an examination of the wall of the choir at this point revealed sufficient data to show the angle of the return faces of the apse, and also to reveal the fact that the two arches and window-heads in the return faces had sprung at a lower level than the centre arch, and were considerably narrower,—a very unusual arrangement. The setting out of the east end on these data gave a line exactly coinciding with that of the piers of the crypt-wall below. This crypt is in itself very curious; it is one of the most roughly-built crypts to be found, the vaulting being turned from massive stunted square columns with huge rough blocks projecting at the springing as abaci; some of the angles of the piers stop-chamfered with a small carved cap at the stop, others plain. The massive character of the nave piers was also remarkable,—massive, unfortunately, in appearance only, for they were one and all found to be mere casings of hewn stone, with no bond and no through stones of any kind, and the interior filled not only with rubble, but even with pieces of timber and rubbish of various kinds. Nothing more discreditable to Mediæval building has ever been brought to light, and it seems amazing that men who could have built a cathedral at all, and one with originally many fine points in it, should have been capable of building, in a practical sense, so outrageously badly. The piers were of such dimensions that, properly built, they would have carried a lofty steeple, but, as it was, they had split and bent in all directions, under the moderate weight of the walls and vault. As it was desired by Mr. Roe that the whole building should be vaulted, as much to prevent further risk from fire as for architectural reasons, the expedient was adopted on the north side (on the south side the whole of the work is new) of shoring up the superstructure with very solid timber centres, and taking down and rebuilding the piers in a more solid manner. The experiment was a difficult one, as Mr. Street has said, but not what we should call a risky one; it is simply a question of properly-constructed and ample shoring. In another place we were surprised to observe the stress laid upon the expedient for raising the arches of the crossing, which were very roughly built, and too low. This was to build a strong brick arch in cement into the wall, piece by piece; then, when it had come to its bearings, to remove the wall and old arch underneath, and turn new moulded stone arches under the brick relieving arches. This is spoken of as something very much out of the way; we have seen it done in a very matter-of-fact manner in house alterations, by persons who did not think it necessary to go back to Mediæval precedent for it. Mr. Street has recorded that he employed the same process in connexion with the work for the nave of Bristol Cathedral, and that the contractor in consequence formally repudiated all responsibility, as proper shoring was not used. We can only say, What an ignoramus that contractor must have been!

The effect of these very thick piers in the nave, 6 ft. thick to openings of only about 11 ft., is seen in the engraving which we publish, showing the view of the nave looking east *: the manner in which the triforium and clear-story are blent into one design, in a rather unusual way, can also be seen here. One peculiarity of the pier design, the use of triple fillets running up the shafts, with the necking mitred round them, can just be discerned, though the scale is too small to show its peculiar effect in marking the shafts with horizontal lines. Among other peculiar points mentioned and illustrated is the treatment of some of the capitals in the transepts, where an arris run up the centre of some of the shafts has its edge line continued up into the capital, and the capitals themselves are very peculiar in design, partaking of the character at once of Romanesque and of later Gothic. A strange feature in the building is illustrated on p. 125, a shaft on which some skittish mason has chosen to carve an ugly and unmeaning knot of flowers, or something else, looking somewhat like a sponge, a little way down the shaft, below the necking. This excrescence, which has been left untouched as a curiosity, is a delightful example of what might have been the result had the cathedrals really been carried out by workmen exercising their own sweet wills, each in his own way. A modern architect who was to find a workman performing such a freak in one of his buildings, might feel inclined to knock the man over the head with his own mallet, and would (morally) serve him right in doing so, though it might not be strictly legal. Another peculiarity of the building is the great prevalence of banding to the shafts; this will be observed in the view showing the restoration of the small apartment now called the Baptistery; but there are other more notable examples than this. The said "Baptistery" is a restoration, on some apparently very slight data, of an apartment which formerly adjoined the outer wall of the north aisle, but which has now been rebuilt one bay further westward than it formerly stood, in order to avoid encroaching upon a narrow adjoining thoroughfare.

In addition to the cathedral restoration, the work executed by Mr. Street, and of which the cost was defrayed by the munificence of Mr. Roe, included the erection of a Synod-house on an adjoining site on the other side of a street, and the connecting of this house with the cathedral in a very picturesque manner by a segmental arched bridge flying over the street

* See p. 198.

and connected by a broad flight of stone stairs with the cathedral. The bridge somewhat resembles that which Mr. Street had proposed to throw across the Strand at the site of Temple Bar, as an adjunct of the Law Courts.

In comparing the plan of the cathedral before the restoration with the plan as it now is, it is to be observed that the choir was much longer previously, and Mr. Street reduced it in length to its Mediæval dimensions, throwing the remainder of the length eastward into a Lady-chapel, as originally was the arrangement. In connexion with this point we may call attention to his remarks, which planners and builders of churches would do well to read. The long chancels of many modern churches, which are quite out of place, are derived from the long choirs of the later Mediæval cathedrals, which were the production of an epoch when there was an immense multiplication of clerical officers, who were to be set apart from the laity, and for whose accommodation these very long choirs were built. Mr. Street has observed, "The naves of our cathedrals were built for the people, who were all intended to be in sight of the choir and altar. It was by degrees, and by a deplorable perversion of the original intention, that the choirs were first filled with a larger staff of clergy, then enlarged for their accommodation, and finally screened off from the nave with solid unpierced screens, in imitation of arrangements which were intelligible in monastic churches, but not in others." When, after the Reformation, the cathedral clergy were much reduced in numbers, they did not occupy the whole choir, and hence came the anomaly of having the clergy and choristers at the west end of "the choir," the nave empty, and the congregation given seats between the clergy and the east end, and a solid screen was put across the west end of the choir, dividing it from the nave, and forming a church within a church. Mr. Street has left on record his protest against this misuse and misarrangement of our cathedrals, especially in cases where the constructional choir is not so long. He has referred especially to Westminster Abbey, a model of what a church for an English Church-service should be, with a short choir representing the apse of the old basilica, and a long nave. Yet here, as he has observed, in an artificially fenced-off choir, a couple of hundred people, selected by favour from the thousands who would like to join the service, are seated, while the larger congregation in the nave are cut off by a solid screen from the sight of the choir, clergy, and from proper participation in the service. The proper use of such buildings would be the use of nave and choir at one time and for one service, the clergy and singers occupying the choir and the congregation the nave. We quite concur with this in the main, and certainly as regards Westminster Abbey, the present arrangement of which for service is deplorable. Mr. Street was well known to be so devoted a Churchman that even the most clerically-minded of ritualists may be willing to accept a practical remark of this kind, coming from him, as worth serious consideration.

We have referred to Sir Theodore Martin's Dedicatory Preface. This is addressed "to Henry Roe, esq., D.L.," and sets forth the primary reason of the publication, in the feeling "that some fitting record should be made of what had been achieved by this remarkable combination of generosity with the highest architectural skill. Justice to both demanded that the story of Christ Church Cathedral,—its rise, the vicissitudes of its history, both structural and political, its long years of neglect and decay, culminating in what seemed likely to prove its absolute extinction,—should be fully told." It was felt that the volume could not be fitly dedicated to any one but the donor of the funds which rendered the work possible; and Sir Theodore expresses the hope that, as "good and noble deeds are the seeds of ever-spreading goodness and nobleness," this volume "may serve as an incentive to works precious to mankind, conceived in a kindred spirit." Of the spirit in which this work was done we are reminded by a quotation from Mr. Roe's letter to the Archbishop of Dublin, containing the first expression of his wish to bear the expense of the restoration,—"In offering this donation to the Disestablished Church of Ireland, I wish especially to make it a thank-offering to the Great Head of the Church for mercies granted me, and for prosperity far greater than I have ever either desired or deserved." We may add one word in recognition of the beauty of the volume in which the record has been enshrined. The beautiful paper, wide margins, the number and high character of the illustrations, and the richly-decorated vellum cover, combine to make it, even in the merely literal sense, an ornament to the finest architectural library.

MODERN BERLIN.

IN these days of practical progress, pursued in every direction, and in every country, no traveller, on revisiting a spot with which he may have been familiar in past years, expects to find it unaffected by modern influences. It forms, indeed, one of his pleasures to speak of the past,—almost always, it will be found, in a somewhat regretful strain,—and it requires but very small inducement for him to commence to retail to any new-comer his previous experience of localities, totally altered in the course of modern improvements. There are some cities, however, which in this respect hold in reserve for the traveller in a more than usual degree a fund of surprise. Paris, in spite of M. Haussmann, is still singularly the Paris of the past; Rome, though tram-cars glide up and down its new and busy Via Nazionale, cut through a quarter a few years back deemed positively unhealthy; New York, though each year its houses progress in rapid jumps further up the peninsula on which Manhattan is built; Brussels, in spite of its grand new Boulevard Centrale; London, and most of our great provincial towns, through all the changes of late years, are still the cities they were in the last generation. Berlin, however, has within but a few years assumed so different an aspect to that of its past, that the inhabitants themselves fairly admit themselves puzzled; and old Berliners,—still adherents to their local beverage of "white beer," consumed out of what appear to the Englishmen to be huge finger-glasses,—will be found any evening in the older beer-houses of the city talking loudly and proudly of their old-day memories. Inhabitants who have been absent five or six years freely express their inability to recognise old landmarks in the broad, well-paved, well-lighted, well-swept, be-tramwayed streets which have superseded the narrow provincial highways and by-ways of the Berlin of a generation ago.

In the face of all the arguments of philosophers, humanitarians, and political economists, one is almost tempted to believe in Berlin in the actual advantages that accrue from a terrible international war; one's views at least, if not staggered, seem to require reconsideration. It is true that to other influences than those of military success the capital of the German Empire owes in great measure the rapidly-increasing position which it is every day acquiring. Its rulers are more than amply aware of the conditions which constitute the formation of a great city in these days of culture, and aided on one side by the action of the speculators, on the other by a large fund of warm civic and municipal pride,—the absence of which in our great metropolis is the cause of much that is complained of,—have been enabled to build up a capital which for many a generation yet to come will be able to supply the wants of the yearly growing population.

Our columns for a long time past have informed our readers of the enormous building activity in Berlin during the last ten or so years, since, in fact, the great Franco-Prussian war, soon after which, it is true, the speculative character of the building transactions was more of a nature to suggest the probability of commercial disaster than ultimate success. But notwithstanding the largeness of the transactions of some years past, it appears now that nothing has been overdone. Noble lines of streets with finely-built palatial houses,—mostly, as in Paris, let out in flats,—have extended and are extending in every direction, while facilities for communication with the most distant points of the town are rapidly increasing; during the greater part of the day and, rare feature for homely Germany, far into the evening, the appearance of a very large area of the city assumes an air of activity and prosperity enough to astonish the most thorough-bred Londoner, and even to lead a Londoner who is familiar with New York and other American cities into dreams of real estate speculation such as appear to be more than realised in the capital of United Germany.

One exceedingly agreeable feature to the traveller who re-visits Berlin after an absence of many years is to find that the great points he so well remembers, while to some extent changed, are decidedly improved by modern embellishments. The Unter den Linden, of world-wide reputation, is the same as ever, and yet more palatial, and if the trees do not appear to have prospered to the utmost, the tall houses on each side of the great promenade, among them the still uncompleted Ministry of Public Worship,—are more grandiose than ever, and overtop even the palace of the Emperor with its imperial flag floating in stately folds above the doorway before which stand in almost Roman solemnity the watchful and constantly-saluting sentinels. The aristocratic Wilhelm-strasse seems, if possible, to be even more stately and lofty than ever in its domestic grandeur, the brilliant electric light,—the incandescent lamp, by the way,—appearing not in any appreciable manner to disturb the retired majesty of the quiet courtyard before the great German Chancellor's palace, or the stately gloom of the tall *portes-cochères* of his ministerial neighbours.

It is impossible for the lover of art to visit Berlin without feeling the warmest glow of admiration for the peculiarly important position taken by the noble art of architecture in creating a great city, and in the German capital it is almost veneration that one is inclined to feel for the traditions of such an artist as Schinkel, whose bust, in company with those of Gottfried Müller, Winckelmann, Cornelius Rauch, and Schadow, so fitly adorns the great colonnade of the National Museum,—Schinkel's own noble conception. It is, indeed, somewhat surprising when we remember how little our people generally at home are familiar with their indebtedness to our great architects of the past that abroad we should so soon seem to possess a personal acquaintance with the great architects whose creations are ever embellishing and enriching the cities of the world. Fortunately for Berlin, the modern workers in the great field of architecture appear to be sufficiently respectful pupils of the master, and throughout the modern work that is now going on in Berlin it is impossible not to be alive to the influence that their classic teacher has had on the men of to-day. Although it would be rash indeed to assert that there is no vulgar, coarse, or pretentious work, there is really so much to admire for its science, its refinement, and its general excellence, that none but an exceedingly bigoted critic would be disposed to cavil. If the work is executed in a very different spirit to what appears at present to be prevailing in our country, it is impossible to deny to it the possession of "style," the attainment of which it will behove our architects to consider closely in their own apparently less pretentious creations. Modern necessities demand great cities, and great cities demand fine houses, and the adequate and healthy accommodation, within a given space, of the largest number of people. Living under very different conditions, working under very different laws,—a material point,—the results obtained by foreign architects are, of course, singularly unlike our own, but we should hesitate before,—as is too often the case,—condemnation is pronounced. We are all too apt to question the merit of types of character and of work, especially foreign, when differing from our own.

With the beautiful belt of greenery which surrounds London, and, indeed, all our great cities, being yearly encroached upon by the advance of bricks and mortar, does it not behove our leading spirits to consider whether we are not doing wrong in not commencing to rebuild on new lines, as all foreign cities are now doing, our existing houses and streets, too often unhealthy, ill-suited for their purpose, and occupying in a most wasteful manner invaluable ground. A visit to Berlin, as a characteristic type of a foreign city of modern growth, is calculated to arouse such thoughts as these, when one finds whole neighbourhoods that once were dens of misery swept away, and replaced by broad streets and tall, well-built, well-drained houses. Why in our midst, as strikes the eye so constantly in London, should we find, at but a few steps from our most populous and gaudy thoroughfares, some of the most wretched dens of squalor that the world knows?

A city like Berlin understands, however, that in addition to grappling with these great hygienic questions,—which must sooner or later be grasped in earnest in our great metropolis, the largest and richest city in the world,

as we are so constantly proud of asserting,—there are other points equally necessary to be considered for the creation of a capital worthy to be the centre of a great empire. Certainly, if academies, museums, and industrial and educational institutions are all that is required to form correct centres of information, Berlin just now can very justly lay claim to a very high position. At the moment we write, there exists in Berlin almost what may be called a feverish desire to do something more than emulate the other great centres,—London, Paris, Boston, and New York,—in the wide field of recognised intellectual authority.

It is somewhat singular in this age of *brio* and celerity,—in this period when so many artists and their friends at home are devoting their well-instructed minds and industriously-occupied days to the reproduction of an artistic period that can, it must be admitted, never be regarded as anything approaching the highest,—that Berlin, one of the great modern centres of artistic civilisation, should be strenuously endeavouring, with the utmost success, to secure treasures of art that bid fair to make the Berlin Museum the successful rival of the Louvre or our own famous institution in Great Russell-street. Certainly, as day by day,—for that is just now the case,—the value of the Pergamon sculptures owned by the Museum is being discovered, the lovers of the marvellous art of the Greeks are discovering fresh beauties which seem to satisfy the most positive ideal of perfection.* Heavy cases of treasures still continue to arrive at the Museum in Berlin, but at present only a few, comparatively, of the Pergamon sculptures are exhibited in positions in which they can be fairly judged. To many of these we have already referred in these columns, and the art-loving world will be soon as familiar with the delicate Selene figure, the great Zeus group, the fiery horses, the Athene group, with the curious resemblance in one figure to that of Laocöon, and many others of the Pergamon altar sculptures, as they are with the Parthenaic or the Phigalian marbles, or our own more recently acquired treasures from Ephesus, which, it is to be hoped, will before long be considerably added to by the exertions of our Museum authorities. This is a direction in which it behoves our country not to allow itself to be outstripped, in the interest not alone of England but of art generally.

While speaking of the Pergamon sculptures, it is impossible to imagine anything more satisfactory or instructive than the large drawing by Herr Thiersch, representing, in accordance with the discoveries up to February, 1882, the restored condition of the once famous altar known to Biblical students as "the Throne of Satan" (Rev. ii. 13). Mr. Bohn was, if we mistake not, the first to present a restored view of the Acropolis of Pergamon, his sketch having been skilfully reproduced in a recent issue of the *Century Magazine*. Herr Thiersch's drawing is, however, in accordance with still more recent discoveries.†

That the Berlin Government should have obtained almost at the same moment such Classic treasures as the Pergamon marbles, and the interesting gathering of MSS. from the Hamilton collection, among them the Renaissance designs of Botticelli, illustrating Dante, is characteristic. That the Germans deserve all the credit, and no one is to blame for allowing them to secure the earlier treasures, is, of course, beyond doubt; but that they should have borne off within a few months the Hamilton MSS. certainly seems to afford grounds for the accusations that have been somewhat freely made as to the possible existence of neglect or indifference somewhere. Not that we, for our part, having looked carefully at the Botticelli outlines, feel that England is likely to suffer in any respect by the loss of the famous Dante and its pictures, because it may be found when these works,—twenty out of eighty of which are at present being exhibited in the Berlin Print Room,—are submitted to the fierce light of modern criticism, that they are deficient in those peculiar graces that have secured for Botticelli the admiration of many modern lovers of art. These newly-acquired treasures are so satisfactorily exposed to the public, who so freely avail themselves of the opportunity for their examination, that we expect for some time to come to hear a great deal regarding these works of the popular Florentine master.

The many other treasures acquired by the German Government from the Hamilton collection are exposed to view with equal liberality, and they certainly possess a value and an interest enough to command the highest regard of the most fastidious, but fortunately for England, which has now lost these works for ever, it will be found that the collection,—40 out of the 700 of which are exhibited with the Botticellis,—possess no quality in any way superior to what our own great public museums already show to the public. Among the many very beautiful illuminated volumes, one little work is architecturally interesting, a Latin MS. of Cyriacus of Ancona, of about 1450, illustrated with pen-and-ink drawings, the page laid open exhibiting the view of the west front of the Parthenon. This is a MS. which we hope may before long be rendered familiar to the architectural public by some one of the many existing processes of photography.

Not content with this successful purchase, the Berlin artistic authorities have, within only the last few days, decided on the acquisition of Dr. Giers's interesting collection of Japanese paintings, consisting of over 100 *kakemonos* or religious scrolls, and as many albums and other illuminations illustrative of the history of Japanese art from the Middle Ages,—a collection at this moment on view in the superb new Industrial Art Museum, one of the most recent noble additions to the German capital. Had we not secured, some years back, for the British Museum, Dr. Anderson's beautiful Japanese collection, we might here again feel sore at the triumph of the Berlin authorities.

In practical as well as æsthetic directions Berlin is yearly making strides towards a position with the aims of which the general public in England is not sufficiently acquainted. We are too apt to continue to speak of the German capital as the old Berlin of the past. New influences are at work which, within a few years, cannot fail to produce the most astonishing results. The ten years of beneficent and progressive legislation which the Germans have now to look back upon have worked positive wonders for Frederick the Great's once little capital on the banks of the Spree. To all interested in the growth of our great cities,—yearly more and more tending to centralise within their walls the life of the country,—a visit to Berlin is a necessity. Illustrations and descriptions, such as these pages have endeavoured from time to time to give, can afford, after all, but a feeble idea of the reality. By an acquaintance with what our foreign neighbours are doing, our great cities, their great institutions and their great factories, will be rendered still more noble, more valuable, and more useful than they already are. The facilities of communication in the present day have placed this suggestive means of instruction within the reach of all; it is not till a general concensus of public opinion is roused that any steady progress can be effected.

* Among the wonderful series of sculptures brought from Pergamos, one female head in particular,—a mere fragment, without a trace of shoulder, and sadly mutilated,—promises to be before long a rival to the greatest marble beauties existing in London, Paris, or Naples.

† Among the latest arrivals from Pergamos are, if not the most important, some of the most beautiful finds yet made. These consist chiefly of a series of architectural details of the most interesting description. Two small niches, about 6 ft. high, of Parian marble, one Ionic, the other Doric, and containing each a statuette, are, we may safely say, simply delicious morsels of Greek architecture.

ACQUIESCENCE IN THE INTERRUPTION OF LIGHT.

IT will be interesting to observe at some future time whether any practical result will follow from the protracted labours of the Institute Committee on the Law of Light. At present it may be likened to the celebrated Congress of Vienna, of which a humorous diplomatist remarked that it "*danse, mais ne s'avance pas.*" We have more than once stated our doubts whether the committee will effect any radical change in the law, but some improvements in details may, if the matter is energetically pushed, perhaps be obtained. There is especially one point upon which there would seem to be room for some kind of change, and that is in regard to the interruption of the enjoyment of light and acquiescence in that interruption, so as to make it not only an interruption in fact, but an interruption in law, and thus become a bar to the further enjoyment of the right by the owner of the dominant tenement. The first suggestion to be made in regard to this point as to the period of interruption which should have the effect of barring the right is that the time might advantageously be shortened. In ordinary cases, if the interruption has continued for six months, the possessor of the light cannot consider, with any justice, that he has been allowed too short a period to vindicate his rights. In general, a man will discover immediately a structure is erected which darkens his windows that his rights are being invaded, and it does not appear to be fair to a person who is erecting a new and perhaps costly building that it should be allowed to remain for several months without expostulation, and then that perhaps nine or ten months after it has been up legal proceedings should be taken. It is right that owners of property should be vigilant, and it does not conduce to practical convenience that laxity in vindicating rights should be encouraged, and consequently there seem to be strong reasons why the present period of interruption should be considerably shortened. On the other hand, whilst we would shorten this period to six months, we would render it incumbent for a man who is obviously about to darken a neighbour's windows to serve a notice on the occupier of the house, addressed to him and to all persons interested in the property that he claims a right to darken the apertures in question, and that he intends to exercise the right which he claims. Because it would never do to ignore the position of reversioners interested in the dominant tenement. It is true that under the fourth section of the Prescription Act the acquiescence must be "for one year, after the party interrupted shall have had or shall have notice thereof, and of the person making or authorising the same to be made." But a more formal notice, such as we have indicated, would appear to be advisable, so as to prevent the possibility of disputes arising.

But upon the actual question of acquiescence it seems also to be desirable that some kind of legal declaration as to what shall constitute acquiescence should be formulated. At present acquiescence is a matter of fact, to be determined by a judge alone, or by a judge and jury. The latter tribunal must say whether, from the circumstances placed before them, they consider that there has been a practical acquiescence in the interruption. In the well-known case of Glover *v.* Coleman (Roscoe's "Digest of the Law of Light," p. 19), Mr. Justice Brett seemed to consider that "the jury might reasonably find that the plaintiff did not acquiesce, and that they might reasonably find that he did not submit, because, although in one sense he submitted, yet he had discontent in mind, and had expressed his dissent to the person who had caused the interruption in a way which showed he did not intend to submit." Therefore it comes to this, that it cannot often be predicated with certainty what facts do or do not constitute legal acquiescence. In some circumstances they may be so obvious that there can be little doubt one way or another; thus, if an action were threatened, though not actually begun during the year, it would be obvious beyond doubt that the person who claimed the right to the light, the owner of the dominant tenement, had neither submitted to nor acquiesced in the interruption. But what seems so very desirable is that there should be no uncertainty about this point, so that any one may, if he will take the trouble, know exactly what he has to do if he would vindicate his rights. And here it appears to us that the Committee of the Institute have a practical opportunity of making a useful change. It might quite reasonably be enacted that any interruption of the enjoyment which continued for six months should be deemed to be a legal interruption unless within that period legal proceedings were begun in order to vindicate the impaired right. It is to the advantage neither of the owner of the dominant nor of the servient tenement that there should be any uncertainty as to what constitutes acquiescence, nor that too long a period should be left open if proper notice,—a point to which we have already adverted,—is given to the person who occupies the dominant tenement. There is no reason why negotiations, if both parties are in earnest, should be long. If both desire to vindicate a supposed right, let it be done without loss of time, and if some kind of compromise can be arrived at it will be the sooner brought to some definite point by the knowledge that, if this does not take place, the aid of the law will be invoked. At present, unless the obstruction is a serious one, a very considerable time often elapses

before the owner of the dominant tenement makes up his mind as to what action to take, and meanwhile every week's delay is, so to say, building up a legal acquiescence. It is, therefore, apparently obvious that the changes which we have pointed out would be steps in the right direction, and they seem, at any rate, to be worth very careful consideration.

HEATING AND LIGHTING.

A GREAT deal has been said of late, and a great deal has yet to be said, on the subject of heating and lighting our homes and our places of amusement, and most foreigners, but especially Americans and Canadians, visiting London are chilled in the first place, but of late have been warm in their expressions regarding our imperfect means of producing an agreeable atmosphere in our apartments. Too many of us, it may be fairly admitted, are disposed to repose with undue complacency in the comfortable possession of bedroom and sitting-room fireplaces that have pleasantly warmed us and our grandfathers for many generations past; we indulge not unfrequently during certain periods of the year in bad complaint at the price and quality of the coal, and are rarely free from the unpleasant consideration of a very heavy coal-merchant's bill; the kitchen-fire alone gives constant cause of discussion, almost more than the most fault-finding Englishman cares to indulge in. It is said that we like to grumble, and a Canadian gentleman has lately remarked in the *Times* that we are so inveterately given to poking our fires that the use of anthracite coal is a positive impossibility in this country, seeing that "hard coal" alone exists in a state of combustion during hours of undisturbed rest.

The question of the use of hard or soft coal is one that, in point of fact, is perfectly understood by the practical man, and consists simply in the knowledge that "hard coal" is positively incombustible without a thorough draught. With the use and the abuse and the habits of bituminous coal we are all too well acquainted, its smoke, its cost, and its "blacks." We love its companionship, its cheerfulness, and its affinities with beef and mutton, and its coquetting, delightful manner of pleasing. Perhaps we like it a little because it is supplied to us by very distinguished personages, for to a great many the only coronetted carriage that ever stops our way is that of the Marquis of Londonderry, whose coal-wagons are just now conspicuous objects in London streets.

But long before, very long before,—we have all arrived at that happy state of existence, when the cost of living will be a matter of indifference, our splendid coal-producing districts will have become mere regions for future geological inquiry, and in the meantime, and very speedily, many of us will have to put up with the inconvenience of using "hard coal," and to submit with a good grace to be instructed how to associate with all the warmth that is required for health and comfort,—the best means of simulating the moist heat that our sensitive natures and our beautiful complexions have become accustomed to. On our own part, we detest the sensation of a stove-heated apartment, and we never enter the noble halls of the British Museum at this season of the year without a feeling of discomfort to ourselves, with which we hope we have a proper amount of sympathy for the custodians of that noble institution.

But we are told, and we thoroughly believe it, that all this uncomfortable feeling, this wasted sympathy, may be avoided and saved by simply placing near the stove which heats the air-pipes an abundant supply of water in order to moisten the air before it reaches the apartment above, and also that each room so heated by a stove beneath should have placed in it a constant supply of the refreshing and life-producing element.

In America, in Germany, in Austria, it is only the vulgar and the uncultured population, the careless and indifferent, who heat their houses and workshops uncomfortably or unhealthily,—and unfortunately, in all countries, the uncultured and the indifferent form a terribly large number of inhabitants; but in America, in Germany, and in Austria, whenever consideration is given to the subject, as it is given invariably in the houses of the tolerably well-to-do, the mode of heating is simply perfect, and, in all cases at a cost infinitely less than in England, where, had people of limited means to warm the very large rooms that most families on the Continent habitually occupy, they would have very little left of their incomes to supply the other wants of existence. After all, the most perfect way of heating large apartments consists in two essential requirements; in the first place, well-planned, well-secured, double windows, without which no means of heating whatever will be effective; and, in the next place, a well-made "porcelain" stove in which hard coal can be easily burned, by which means a room 30 ft. square, and proportionately high, may, in the coldest weather, be kept at a perfect temperature, or as high as individual taste may desire, at no very considerable cost. The simple expedient of the double window is enjoyed by the poorest throughout Germany and Austria, while the "porcelain" stove is rapidly replacing the abominable and unhealthy iron stove of the past.

As to the matter of lighting, Mr. Edison and his numerous rivals will very soon tell us something more, and any one desirous of obtaining, with no very great amount of trouble, definite notions as to the relative value of electricity and gas for large buildings, has only to visit the Savoy Theatre to enjoy the delight of a perfect mode of illumination. In private establishments electricity has with us not yet made much way, but from personal experience of the comparison of two of the largest of the many gorgeous *cafés* of Vienna,—one lighted by electricity, the other by gas,—it is not difficult to decide which is the more comfortable of the two; the absence in the electric-lighted room of that singularly exhausting atmosphere, the result of the air burned and befouled by the gas, has proved to us completely what a future lies before the domestic use of electricity for illuminating purposes. As the gas will have in such establishments to be more and more freely used to compete with the brilliancy of the electric light, so only the more will the air become exhausted and the ceiling paintings be dimmed. The struggle is likely to be a warm one yet for some time, but no one can have a doubt as to which will win the day.

THE DECORATION OF ST. PAUL'S CATHEDRAL.

SIR,—Having, during many years, thought and felt much on the subject of the proposed decoration of St. Paul's, I cannot resist the impulse, obtrusive though it may seem, in the present posture of the affair, to offer a few remarks and suggestions thereon. I do so under the impression that neither the gentlemen forming the Decoration Committee nor the Dean and Chapter claim exclusive right to deal with an edifice which every Englishman, or rather every Great-Briton and Irishman, has an interest in,—an interest increasing in proportion to his power of appreciating it; but, on the contrary, are willing to receive pertinent hints.

My attention was first drawn to the subject as early as 1852, by communications thereupon to the *Builder* from Messrs. Penrose, Papworth, Garbett, and others: after reading which I expressed my own views in a paper to the Liverpool Architectural Society, published in the *Builder* in 1853, and afterwards in the Society's Transactions. In this paper, after propounding a theory of interior decoration for a great edifice, and suggesting certain colours for the walls of St. Paul's, with a mode of treating the windows, I remarked, in reference to the dome, "It is clearly the dictate both of nature and reason that a dome should be divided neither by parallel circles nor by meridianal arcs, and should be decorated only by some delicate detached ornament, that will neither interfere with its curvature, nor disturb the breadth of its repose. But a series of pictures on a dome like those of St. Paul's at present, not only divide the dome, but by their backgrounds visually annihilate the surface they cover. The matter is made worse, however, when one picture covers the entire concave, as then the whole dome disappears at once; for wherever the eye turns, it is carried out of it; visually it is a dome no longer. I would, therefore, humbly suggest the obliteration of the present paintings, and the relief of the vast expanse of the dome by two tiers of detached ornaments of simple and dignified character, analogous in general shape and disposition to wreaths or medallions . . . . . They might be circular, polygonal, or stellar in shape, and harmoniously coloured, or there might be two forms and sizes alternating. They could be formed into hollow figures or rings, in which might be inserted sacred emblems, as those of the Christian virtues; symbolic animals, as the lion, eagle, dove; attributes of St. Paul; arms of the See of London, &c. The whole must be made the subject of careful design, and placed to correspond to the intercolumns of the dome tower below, one over each. All the minor cupolas of nave, choir, and aisles I would decorate in like manner on a smaller and simpler scale."*

The circular or polygonal features, wreaths or medallions named above, which I suggested as best calculated to preserve the spherical unity of the dome, you will perceive are an anticipation of the circular frames, confessedly the characteristic feature of the late Mr. Stevens's design, just brought forward. My circles, I suspect, are smaller and more numerous than his, but I think as large as they should be to preserve the sphericity of the dome.

But my chief object in this communication is to give you my present views and feelings on the important subject of the finishing of St. Paul's.

I feel now, as I have felt all along, that St. Paul's is in danger of serious injury to its grand and solemn spirit, chiefly by getting into improper professional hands. Nothing is easier than in the course of decorating such a building to spoil it, and unless the work be done under the direction of one competent architect, who has drunk into the spirit of Wren's design, and is entirely free from Mediæval predilections and sympathies, it may be found, after a great expenditure of both thought and money, that St. Paul's is poorer in artistic qualities than at the outset,—that in proportion as it has become beautified, the whole has grown "beautifully less." Freedom from Mediæval predilections I consider a *sine quâ non*. A modern Gothic architect could not, if he would, work in the spirit of the place; and should not be entrusted with it were he William of Wykeham risen from the dead.

Let me respectfully suggest that, before anything further be done, a large view of the interior of the cathedral in its present state, and exactly coloured, be taken, from the west end; and that the proposed scheme of colour or decoration be drawn on it, to ascertain the change that would thereby come over its spirit. Or that the scheme of decoration be tried on a fac-simile copy of it, so that the two conditions of the cathedral might be compared. The proposed treatment of the dome might be tested in like manner on a view of it from a good standpoint.

Such views seem needful to the architect in scheming out the decoration. The cost of them would be less than that of a model, and would be as nothing compared with the cost of probable blunders.

But it should be much easier to finish St. Paul's than to finish some Gothic cathedral, as in the case of Cologne Cathedral; in which the difficulty would be to get into the spirit of its age. The spirit of St. Paul's is that of the present age, its style being the Italian style of the day, with which we have full sympathy. I believe all that is really needful to be done could be done in a comparatively short time, and at inconsiderable cost.

Reference is often made to how Wren himself would have finished it; or what he intended. It would be interesting, of course, to learn what his wishes were. But St. Paul's should be finished not as Wren would have finished it, but as he should have finished it,—as the building demands to be finished.

Though I have high authority, including clerical,† against me, I should earnestly recommend that no historic painting be introduced into the cathedral, not only because making a pictorial Bible of it would be less consonant with the spirit of Protestantism, which dwells in the Bible itself, than with that of Catholicism, but because no effort of the art of painting can do justice to the sacred narratives, or do aught but disappoint the devout reader of the text, if they do not, indeed, fall short of his own conceptions of the subjects, more especially with regard to what must ever be the central figure in them,—that of the Saviour. This has

* See *Builder*, vol. xi., p. 53.

† The making the cathedral a great pictorial Bible was earnestly advocated by Archdeacon Hale in a discussion at a meeting of the Royal Institute in 1852, reported in the *Builder* (vol. x., p. 466), and approved of by the late Sir G. G. Scott.

scarcely, if ever, been satisfactorily rendered, even by the great masters of the Roman and Florentine schools. "The Christ of Michelangelo," says Fuseli, an eminent painter as well as critic, "is severe; the Christ of Raffaelle is poised between the heraldry of Church tradition, and the dignified mildness of his own character; the Christ of Guido is a well-suspended corpse." Perhaps the most successful Gospel scene ever painted is the "Last Supper" by Leonardo da Vinci. Of it the same eminent critic affirms, "The face of the Saviour is an abyss of thought, and broods over the immense revolution in the economy of mankind, which throngs inwardly on his absorbed eye," and "that neither during the splendid period immediately subsequent to Leonardo, nor in those which succeeded to our own time, has a face of the Redeemer been produced which approached the sublimity of his conception." And yet, as Vasari asserts, he left the head imperfect and unfinished; showing, it is evident, that he could not satisfy himself or reach the embodiment of what he conceived to be the result of the union of divine or incomprehensible and infinite power with the purest humanity. He found, in some village haunted by villains, a fit model for the face of Judas, and so succeeded in rendering his character, as well as the characters and emotions of the other disciples, to perfection; but he found no human face from which he could climb to a conception worthy of the countenance of Christ.

If, then, the greatest masters of the greatest art-period of Christianity, including the divine Raffaelle and Guido Rheni, on whose pencil grace and beauty were said to dwell, have so far failed, who can hope that a collection of New Testament subjects painted at the close of the nineteenth century, — a period when, from the prevalence of a more worldly spirit, there must be less sympathy among painters with the character of Christ, would be anything but failures in the all-important point of expression, however perfect in design, composition, colour, or chiaroscuro? Titian and Vandyck have painted portraits which condense into one point of time, and exhibit at a glance, the whole history of eventful lives; and I doubt not our living painters could do wonders in the same way. But who could do justice to the moral grandeur of face and mien of the Redeemer? What tender or magic strokes of art could form a countenance the index of a mind of spotless purity, of unrivalled benevolence, the visible manifestation of his religion? The endeavour to do it would be the finite attempting to grasp the Infinite.

Set our figure-painters to adorn the New Houses of Parliament and the New Courts of Justice with scenes from the history of England and Scotland, and they will do justice to their subjects and honour to themselves; but fill St. Paul's Cathedral with historic pictures of Biblical scenes and transactions, in oil or fresco, by the best historic painters in England or Europe, and the general effect will be insensibly to lower the sacred volume, more especially the great Biography, in the minds of the people. Not even the parables of Christ could be adequately illustrated, as their characters include generally the Divine Being. These and the sacred narratives are so poetically and vividly presented to us in the Scriptures that they paint pictures themselves on the reader's imagination superior in most instances to the highest efforts of art. As sketches, in which the ideas of the composition and character are only just touched upon, give more pleasure to the imagination than the finished work, so in reading poetry, the imagination supplies more, probably, than any painter could produce. Writing is the most perfect vehicle of knowledge, and, when elevated into poetry, which large portions of the Bible are, it is also the highest; and the painter, as Sir Joshua Reynolds remarks, has but scanty means of exerting those powers over the imagination which make so very considerable and refined a part of poetry.

While historic pictures, in falling short of the sublimity of the Bible sentiment and imagery, would rather lower than elevate the place, inscriptions, consisting of choice comprehensive passages from Holy Writ, more especially the Psalms and the Gospels, including the chief events they narrate,—a sort of condensation of the Sacred Book,—would, I believe, have a contrary effect, and form the highest and most spiritual adornment that could be conceived; for they would clothe the cathedral with the literary grandeur and beauty of the Bible itself. They should include the maxims and precepts which are, for the most part, so simple that the most ignorant may comprehend them, and the wisest must be charmed and awed by the majestic simplicity with which they are expressed. These passages, among which, if anywhere, are thoughts that breathe and words that burn, would be so many ever-shining lights, emitting the highest wisdom, which, if the cathedral be thrown open to the public all day long,—which I think you will grant it should be,—could not fail to have a great moral and religious influence. To the inner eye of the intellectual and imaginative they would people it with the grandest conceivable images and scenes; and to their inner ear they would make the voice of the Redeemer and His apostles resound through the vast aisles of the church.

If it be possible for man to hallow a place of worship, or to be the instrument of hallowing it, which is pre-supposed in the ceremony of consecration, then I know nothing so calculated to do it, in the eyes of men or angels, as lining it with the sublime language and imagery of the sacred volume; which would in effect be inscribing on it what was engraved on the High Priest's mitre, "Holiness to the Lord."

It would, I conceive, be most consonant with spirituality of worship,—the essence and spirit of Protestantism, which is built on the Bible alone, and not like Catholicism, on the Bible jointly with apostolical and ecclesiastical tradition; and I think the wise and prudent would rather stake its æsthetic credit on the sublime language of the Bible itself than on the most successful pictorial representation of its chief scenes. The principle I am here contending for would exclude illustrations of the *Te Deum*, as well as of the *Apocalypse*.

But this is not all: I must remind your readers that it is a matter of history that images and pictures, from having been used in the Western Church only as objects of instruction for the ignorant, became in the seventh or eighth century abused into objects of worship, and that though popular education and other circumstances are different now, yet human nature is still the same.

Should exception be taken to inscriptions, which, by the way, could be woven into infinitely greater beauty than they have ever yet been in England, by taking lessons from the Moors,—on account of their being a Pagan and Mahommedan decoration, I would remark that they were also an ancient Jewish one, the Israelites being enjoined by Moses to write the statutes and commandments of the law which he gave them, not only on their hearts but on the door-posts of their houses, and on their gates.

I do not advise that inscriptions should be the sole decoration of St. Paul's. Besides rich and beautiful materials, as marbles in linings and panellings, the glories of the inanimate creation, as they show forth the energy of Divine goodness, offer themselves as fit subjects for the adornment of His house.

With regard to the dome, the painter should be controlled and guided by architectural regard for its grand form, which, perhaps, when unadorned is adorned the most. Nay, a dome of the magnitude of St. Paul's, worthily connected, affects us chiefly by its unity and vastness, and expression of human power. Hung over the empty space, and hiding its limits in its greatness, it is necessarily sublime.

The dome of the Cathedral of Parma,—a good deal referred to,—is no guide in this matter; for Correggio, in pursuit of his favourite quality,—harmony,—would care little of what became of the architectural qualities of the dome. In fact, the "celestial hubbub" of his cupolas, though it shows from below with great exactness, annihilates the architecture.

A better guide will be found in the ceiling of the Sistine Chapel by Michelangelo, who, in all the subjects there painted, except the first (the Deluge), which, on finishing, he perceived to be on a wrong principle, introduced no backgrounds or figures on more than one plane. Michelangelo was architect as well as sculptor and painter. Correggio was painter only.

SAMUEL HUGGINS.

The India Office having advertised for tenders for the supplying of fifty-two weighing-machines, amongst others tendering was the firm of Messrs. Bartlett & Son, of Bristol, who were successful.

ARCHITECTURE OF THE HIMALAYAS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Mr. Horace Jones, President, in the chair, a paper by Mr. William Simpson, Honorary Associate, was read by the secretary, in the unavoidable absence of the author. The paper, which was illustrated with a selection of original sketches, commenced by remarking on the large geographical extent of the Himalayan regions, but the author said he proposed to deal mainly with the architecture of the Sutlej Valley. The time he spent in the hills was limited to two summers, those of 1860 and 1861, so that it was now over a score of years since he visited it, a lapse of time which had brought with it many regretable gaps in his memory. In 1862 he returned to England by Cashmere, on the architecture of which country, as he reminded the Institute, he read a paper before it in that year, and but a few years ago he had given them an account of the Buddhist architecture of the Valley of the Jellalabad. He thought the Himalaya buildings were originally wholly of wood, in view of the vast forests of *Cedrus deodarus* to be found there still, and of the analogous instance of the primæval wooden architecture in the Indian plains. In the parts of the Himalayas which he visited, stone, of which there was, of course, no lack in a hilly country,—was used in combination with timber, but the structures he saw were of no antiquity, and were undated. From the Sutlej to the Ganges both materials were used for most of the better class of houses, and even for very poor ones, reminding one of the old English combination of wood and brick, as at Chester. But in the Himalayas the wood was always laid horizontally, and never perpendicularly or diagonally, as in the English examples. In the well-built houses the wood was very carefully arranged, the beams being a foot or so in depth, extending the whole length of the wall,—a beam on the outside and another on the inside, the space between being filled up with stone,—the wall at right angles having its beams laid on the two just mentioned, on which again rested the next set of beams of the first-mentioned wall, and thus they went on alternately. In one house which he saw building the ends of these beams were slightly let into each other, so as to hold them in their places, and, in addition, small pieces of wood were dove-tailed in between each pair of beams to prevent their bulging out through the pressure of the stones. From this description it would be understood that the mass of woodwork was capable of holding together of itself without the stones, which are filled in between, to make it a solid wall. On the top of this combination of wood and stone stood the real dwelling, which was altogether of wood. By means of beams it overhung the more solid structure beneath. The style was illustrated by a drawing of the Bussahir Rajah's palace at Serhan, of which a detailed account was given. A comparison was also drawn between this palace, still occupied in 1860, and buildings dating from the reign of Asoka, B.C. 250, which are figured on the gateway of the Sanchi Tope in Central India. In spite of differences in detail, the points of resemblance between the two Indian styles, parted by twenty-one centuries in time and by half the length of the vast peninsula in space, were found very striking. In both cases there was a lower story of considerable height, in both the windows were very small in size and very few in number. The lower part of these houses dating from Asoka might, Mr. Simpson owned, have been of stone, but he was inclined to think it was generally of *cucha* or sun-dried brick. There was nothing to show it to have been of wood. Above this story came the part of the house in which it was plain from the sculptures Asoka's people lived. It overhung the lower part, and was wholly of wood. In general this upper story was very like the Himalayan examples. But when they compared the details there was considerable difference in the forms, the most marked being the circular roof, instead of the pointed, as at Serhan and elsewhere in the Himalayas. Still, while recognising these dissimilarities, we had in these Himalayan houses the nearest approach among the present styles of Indian building to that practised in Asoka's time. In the Dravidian architecture of Southern India most of the details could be traced back to the same old Buddhist period, but not only had the style been changed but the construc-

tion was altogether different, so that the general result had no resemblance. There was every reason to believe that from Cape Comorin to the Indus, and most likely beyond that river, the houses 2,000 years ago were all built much as represented in the sculptures at Sanchi and elsewhere. This mode of erection had long ceased to be practised, and the houses now to be seen in the plains bore no likeness to those of the past. The Himalayas had not been so liable to the effects of conquest, and that was why so many things there were left unchanged, the architecture amongst them. Mr. Simpson discussed next, at considerable length, the question as to what led to the geographical separation of the two forms of roof, comparing forms found in Cashmere, Nepaul, and even in China, but confessedly without arriving at any tangible result. For himself, he could easily accept the antiquity of the types peculiar to the Himalayan villages. He was impressed with the marked primitiveness of almost all he saw there. Their religious rites bore a stronger likeness to those of Palestine in David's time, than to anything found in India. Every village had its *khuda* or god, which was carried about on men's shoulders with staves, exactly like the Ark of the Covenant. On festival days, the villagers danced round these objects of worship, as the Hebrew King did round the Ark. He saw some temples which were away from the villages, in sacred groves of the Deodar, these trees never being cut down save to repair the temples, reminding us of the cedars of Lebanon, which to this hour were held holy from their having been used in the building of Solomon's Temple, the link of association being all the more noteworthy owing to the fact that the *Cedrus Libanus* and the *Cedrus deodarus* belong to the same botanical genus. Some account was given of the temple at Chini and of those at Chergaon and Jacko. In front of the first-named stood a picturesque structure called a Dharamsalah, a word meaning rest-house. Each village had one, and they were placed in front of the temples. Travellers used them for resting in, as they were the only hotels in those parts of the world, but they were also used for ceremonies; for the Devi or god was sometimes brought out and placed there. The Dharamsalah stood on a rudely-paved circular space, resembling one of the village threshing-floors. At one of the Chini festivals the Devi was brought out and carried round the Dharamsalah. A rude kind of music was kept up with long horns and drums, the men and women holding each other by the arms entwined behind their backs and singing all the time, swayed backwards and forwards, as if salaaming the Devi. Thus they went round in a ceremonial dance, followed by the Devi borne on the shoulders of two men, with others near it as attendants. Between the dances the Devi was placed in the Dharamsalah. At the temple in the woods near Chini, there was a Dharamsalah in which the Devi was placed when the blood, fruit, and other offerings were presented to it. Mr. Simpson said he had been silent as to the many forms of Himalayan architecture copied from the plains, his object having been to describe those features peculiar to the hills. But he must make one exception as to temples with Sikras, *i.e.*, the curvilinear towers or steeples peculiar to Hindoo temples, of the Himalayan types of which he accordingly gave some account. He spoke also of the temple at Gangootree, sacred to Gunga-jee in the respectful manner of referring to the Ganges, represented there by a female and a crocodile. An appendix was devoted to the Himalayan bridges, which were very graphically described. Their construction in each case was the result of the materials to be found in the different localities. In the Darjeeling part of the Himalaya, where the bamboo was plentiful, that was the material employed; in Thibet, where wood was scarce, bushes twisted into ropes were used. In the Sutlej valley a favourite kind of bridge was a single rope made of the hair of the Yak or wild cow of the Himalayas. In those regions, as elsewhere, streams varied in size and bridges also in every detail. He had himself passed over some very simple structures of the most rudimentary types, and many of them were in such a shattered condition for want of repairs that a respectably brought up barn-door fowl might have thought twice before venturing to proceed. Mr. Simpson pointed to a slight sketch of a bridge over the Sutlej at Wangtoo. As that place was on the Hindostan and Thibet road it might have been taken for granted that British engineers had something to do with it, but it was constructed in all its details on the native plan, and he was under the impression of having somewhere read that its span is 70 ft. The object evidently was to give weight to support the large deodar trees built into it. The accompanying illustration represented a bridge over the Tonse River. It had once been a substantial erection, but was now somewhat the worse for wear. Its details might be easily followed. Some years ago he had seen a picture of a Norwegian or Swedish bridge, so like these Himalayan bridges that it might have passed for one of them. After describing some of the bridges in Cashmere, Mr. Simpson remarked that none of them have railings, the absence of which was wont to strike the eye of the European at first sight of them. One of the bridges at Srinuggur, built in this style, had a row of wooden shops on each side, as if in quaint parody of old London Bridge. Mr. Simpson added some notes on Thibetan architecture. They were for the most part illustrations, covering a wide Buddhist area, of an inference drawn by him in his paper read three years ago, from one or two small fragments of a Buddhist monastery, that the walls of such buildings were wont to slope inwards.

In the discussion which followed,

Lord Stanley of Alderley observed that although several of the drawings exhibited by Mr. Simpson showed resemblances to exist between the buildings of the Himalayas and those of China, still, he believed that those resemblances were solely due to the nature of the materials used. People using fir logs for building in mountainous regions would necessarily build in the same way. Many of the *châlets* of Switzerland had roofs very similar to those described by Mr. Simpson as existing in the Himalayas, and such roofs were common in the Basque country. Therefore, he did not think too much stress should be laid on the inference drawn by Mr. Simpson from the sculptures which depicted the houses of King Asoka's time.

Mr. Kidner concurred with the last speaker. As to Mr. Simpson's theory regarding the batter given to the walls of Buddhist temples, he (Mr. Kidner) had been in China, but as far as he had seen, whenever a batter was given to a wall, it was only as the outcome of necessity, as, for instance, in retaining walls.

Colonel Yule, C.B., pointed out that there were two possible origins of the resemblance of buildings to each other, one of which undoubtedly was, as had been pointed out, that with similar materials similar results would be produced; but there was presumptive evidence that the resemblances noted by Mr. Simpson were the result of other influences. Some of the bridges of the Himalayas were constructed exactly on the principle of what was sometimes called "the false arch," which was one of the most ancient methods of construction in the world, the stones on either side of the opening to be spanned being corbelled out one above another, until, when the two halves nearly met, the intervening space could be spanned by a single stone. This method of construction was seen in the Treasury of Atreus, at Mycenæ. In one of Mr. Layard's books would be found a plate showing a bridge of similar construction. He had seen a drawing of a bridge in the Andes very similar to one of the bridges sketched by Mr. Simpson in the Himalayas. These were all, of course, illustrations of the results of natural contingencies, or, in other words, of the outcome of necessity in dealing with like materials under somewhat similar conditions. But he did not think that the roofs described by Mr. Simpson as existing in the Himalayas, and found in China, Burmah, and Siam, owed their similarity over so large an area entirely to structural necessities. He could not help thinking that there must have been some direct communication of the style that went with the Buddhist religion in the early times. There was one peculiarity to be found in all the palaces of China, Java, and Burmah, viz., a kind of central hall, similar to that to be seen in all pictures of the Palace of Pekin. Upon a great central mass of masonry was raised a large pillared hall of timber, roofed with wood. The same feature, or the consequence of it, existed in India,—for example, in the great Palace of Delhi, where the great central mass of masonry was surmounted by a colonnade of masonry. He believed that this was a peculiarity originating in India. Mr. Simpson had alluded to the resemblance of the architecture of the Himalayas to that of the houses shown on the bas-reliefs of ancient Buddhist structures. The resemblance was very striking. In each case there was a stone substructure, over which projected the upper or habitable part of the house, built for the most part of timber. The difference shown in the roofs was, however, very remarkable. In what way the semicircular or horseshoe form of roof (shown in the sculptures on the Sanchi tope of houses existing in the time of King Asoka) originated, it was not easy to conjecture. It might possibly have originated from the use of bamboo bent over a building to form supports for the roof-covering. The shape of this, which was, perhaps, the most ready form of roof available, might afterwards have been imitated in carpentry. That the horseshoe form of timber roof did not arise out of structural necessities seemed to be established by the fact that such roofs were actually introduced within the solid rock-cut temples.

General Maclagan, R.E., said he had been over very nearly the whole of the ground traversed by Mr. Simpson, and it occurred to him whether it might not be that one object sought to be attained by the use of the roofs with verandah-like openings which had been described was to afford a space for promenade under them, which should be free from snow in winter time, and available for what would be equivalent to out-door exercise. With regard to the bridge mentioned by Mr. Simpson as existing over the Sutlej at Wangtoo, the actual span is 120 ft. At the time when Mr. Simpson visited it it was a native structure, but it had since been re-constructed by British engineers on exactly the same principles, although it had been more solidly built. The same method of construction was used because the materials required were found actually on the spot, and because the only available labour was that of men who were familiar with the construction of such bridges. This particular kind of bridge was of some interest at the present time, for it embodied the principle which had been adopted by Mr. Fowler for the bridge which would have the largest span of any in the world,—that over the Forth at Queensferry. From the piers and abutments arms would stretch outwards and upwards until the span is capable of being covered by a single girder. The principle of construction would be virtually the same as that in the Himalayan bridge, but the material being so different, viz., steel instead of wood, the details would vary to some extent.

Mr. H. G. Keene said that the roofs described by Mr. Simpson as existing in the Himalayas, and those to be seen on the *châlets* of Switzerland, were, of course, very similar, but their similarity was suggestive of nothing beyond their suitability to throw off the snow which fell upon them. Mr. Fergusson maintained that the Hindoos were not ignorant of the arch, for the rock-cut temples afforded evidence of their acquaintance with it. But, said Mr. Fergusson, they refused to use the arch, because they believed that an arch never slept. With regard to the vaulting of the Taj, it was, in his opinion, built without centreing, in the same way as a domed mausoleum which he saw being erected at Agra. The workmen built circles of stones one above another, gradually converging to the centre, the rings or courses being clamped back to each other. Thus there was no true vault, and not even an arch.

Mr. Purdon Clarke said the peculiar roofs described by Mr. Simpson occurred in parts of India most remote from the Himalayas, and where there was no fir timber. For instance, on the Travancore coast such roofs were very common. He believed that Mr. Fergusson had called attention to this circumstance, but was unable to offer any explanation of it. With all deference to the opinions of some of the gentlemen who had spoken, he did not think that the roofs in question could be accounted for on the ground of climatic necessities.

Mr. Kidner observed that large projecting roofs of the kind referred to were suitable to either cold or hot climates. In the one case they would throw off the snow, but in the other they would keep off the heat.

Mr. Lilley, of the Royal Asiatic Society, said that his researches led him to conclude that the earliest architecture of India was of the pagoda or Chinese type.

Mr. Phené Spiers said he had been struck

with the extraordinary resemblance which was to be seen between Mr. Simpson's drawings of Himalayan buildings, and drawings of Japanese temples. It had been suggested that the fringe-like ornament which was a feature of the exterior of the temples was suggested by pendent icicles, but in his opinion it was the outcome of the custom of hanging up on the occasion of certain festivals and ceremonials fringes of wool or paper.

The Chairman, in closing the discussion, said that Mr. Simpson's paper was a very interesting one, and raised some curious questions which were well worthy of further consideration. There was no doubt that, as had been suggested by some of the speakers, the use of like materials under like circumstances would produce somewhat similar results, and to this was to be attributed the fact that Mr. Simpson's drawings of buildings in the Himalayas were somewhat reminiscent of corners of Nuremberg and of buildings in Norway. With regard to the vaulted tombs of India to which reference had been made, Gwilt, in one of his early works, narrated the circumstance that a rajah, wishing to build a fine mausoleum for himself and his family, sent out an intimation that any one who would undertake to build the structure should receive a very handsome reward. One man, who was well known for his skill, ingenuity, and resource, offered his services, which were accepted, and he began the work. When he had built the walls a few feet above the ground level,—to the height, in fact, at which he proposed to spring his dome, he suddenly disappeared, and no reward that could be offered could induce him to return until a year had elapsed, when, at an audience of the prince, he again made his appearance, when he was recognised and seized. When asked what excuse he had to offer for his absence, he replied, "Great Prince, I have come back, and am now ready to complete your tomb. If I had not left the walls for a year to settle, you would have induced me to go on building the dome within a very few months, and it would have fallen in, and then, hopeless would have been my fate! Now that the walls have consolidated, I shall be happy to finish your tomb, and it will stand!" In conclusion, the Chairman put to the meeting a vote of thanks to Mr. Simpson, which was carried with applause, and the meeting terminated.

"ANTONY AND CLEOPATRA."

MR. TADEMA, in an appreciative note in reference to our remarks on his picture under the above title, says, "I regret that you mistake the scene of action. It is not in Tarsus, but in the harbour of Alexandria, the arrival of Mark Antony in Egypt; hence the Roman Fleet." We, of course, supposed that the picture was intended to represent Antony's first sight of Cleopatra, when she produced such an effect by appearing in her barge as Venus, as described in the picturesque passage in Plutarch which Shakspeare has closely imitated in his drama. Now, Plutarch expressly says that Mark Antony summoned Cleopatra "to make her personal appearance in Cilicia to answer an accusation that she had given great assistance in that war to Cassius." (We quote from the latest and best English translation, that edited by Clough.) After receiving several such mandates, "as if in mockery of them, she came sailing *up the river Cydnus*, in a barge with gilded stern and outspread sails of purple, while oars of silver kept time to the music of flutes and fifes and harps." Of course, if Mr. Tadema does not mean to represent the *first* meeting of the famous pair, but only one of their subsequent re-unions, it may have been in the harbour of Alexandria; but the supposition would take away a great deal of the point of the picture, as far as the expression of the two principal figures is concerned. If it is intended to represent their first meeting, that meeting unquestionably did *not* take place in the harbour of Alexandria, but at Tarsus, the principal city on the Cydnus, where Antony apparently had at the time his headquarters. The question does not at all affect the real value of Mr. Tadema's fine painting; but the attitude and expression of Antony, conveying the idea of mingled surprise and curiosity, certainly suggest that he sees Cleopatra for the first time, and in that case the mistake about locality is Mr. Tadema's, and not ours. The presence of the triremes would be equally probable in either case. Tarsus, though a few miles up the Cydnus, was a port, and Antony would, no doubt, have had part of his fleet with him there.

ROYAL ARCHITECTURAL MUSEUM.

THE annual meeting for the distribution of prizes gained by the students of the School of Art established a few years ago in connexion with the Royal Architectural Museum, was held in the Museum, Tufton-street, Westminster, on Monday evening last, the Right Hon. A. J. B. Beresford-Hope, M.P., President of the Museum, in the chair.

From the statement read by Mr. Randall Druce, the curator, it appears that during the school session extending over a period from September, 1881, to July, 1882, ninety-six students attended the evening classes, twenty-five the Saturday afternoon Life Class, and nine the Saturday afternoon Ladies' Class. The Plasterers' Company's second prize was gained by Mr. Treleaven. This is the fifth year that either the first or second prize offered by that Company for modelling has been gained by students of this school. In all, 80*l.* 14s. 6d. was earned as a Government grant.

The following are the names of some of the principal prize-gainers, viz., Thomas Treleaven, Silver Medal, and the sum of 4*l.* given by the Plasterers' Company for design for a bracket; Robert Stephen Ayling, Bronze Medal, for design for iron gates; and James Thomas, Bronze Medal, for studies of mosaics. Queen's Prizes were gained by Thomas Treleaven, R. S. Ayling, James Thomas, Joseph Holgate (for Design), and Alfred Johnson (for Painting from the Life).

Mr. Beresford-Hope made an excellent and characteristic speech, and Mr. J. P. Seddon spoke as to the efficiency of the teaching given in the school, especially by Mr. Brown, the head-master.

A vote of thanks was accorded by acclamation to the chairman, and the meeting terminated.

PETERBOROUGH CATHEDRAL.

ACCORDING to promise, we now give a view of the central tower of Peterborough Cathedral, which shows also the fine clearstory and other parts of the building.

It is stated that in consequence of additional work undertaken in connexion with the restoration of the Cathedral, involving the complete removal of the present choir-screen, it is anticipated that preparations for pulling down the dangerous central tower will not be completed for at least a month. The Dean and Chapter have intimated their intention to extend the choir to its original dimensions; with this object the fine screen, erected fifty years since, is undergoing demolition. The portions of this costly screen are being deposited with the late Dr. Jeune's memorial pulpit in the eastern chapel of the cathedral. The stalls of the Dean and Canons are also being removed. A thorough restoration of the cathedral having been decided on, it is expected that the work will extend over about five years.

The Dean and Chapter do not propose to publish a list of the subscriptions received until they are prepared to state generally their intentions as to the nature and extent of the works proposed to be undertaken.

ROYAL COURTS OF JUSTICE CHAMBERS, STRAND.

THIS building, which is now rapidly approaching completion, is erected on a plot of land of some 10,000 ft. area, exactly opposite to the Strand entrance of the great quadrangle of the New Courts of Justice. It enjoys the further advantage of having at its southern extremity an entrance direct from the Middle Temple, from which a broad covered footway will lead up into the Strand, and down into a subway to the Law Courts, which is proposed to be formed under that thoroughfare.

The building consists of two basements, ground, mezzanine, and five upper floors, and is divided into three sections:—1, a legal business club, occupying the whole first floor of the front building; 2, offices, consultation and arbitration rooms, for letting, occupying the remainder of the upper floors; 3, a restaurant which will take up the ground-floor and both basements, the mezzanine, and kitchens on the top of the west wing.

The Strand front, a view of which we give in our present number, is for the most part in red sandstone, from Aspatria, and is treated in the style of the French Renaissance, but with rather bolder detail and very slight proportion of carving. The whole of the ground-floor façade is, however, in polished red Peterhead granite, supplied by Messrs. Manuelle, and is somewhat more severe in treatment.

In the restaurant a novel feature will be the crypt or upper basement, which covers the whole site, and is some 135 ft. long and 79 ft. wide. It has been carried out with Norman piers and groining, and will be artificially lighted and ventilated. On the ground-floor, which is 21 ft. 6 in. high in the clear, there is a dining-room, 32 ft. wide by 48 ft. long, and a luncheon-room, 36 ft. wide by 79 ft. long, with smaller bars in the front and on the mezzanine.

The internal fittings are in American walnut, relieved by sequoia and oak.

The whole of the front vestibule, one side of which is open to the street, is lined with Doulton ware, from the well-known Lambeth Art Potteries, which also have supplied the numerous hand-painted tiles on which the decoration of the interior chiefly depends.

The offices will be served by rapid passenger and deed-box lifts, which together with the service-lifts of the restaurant, will be worked by high-pressure hydraulic power, and are being made by Messrs. Archibald Smith & Stevens, of Battersea.

The building will be supplied with water from an artesian well, which is being sunk by Mr. Thos. Tilley, well-engineer, and will be lighted by about seven arc and 200 incandescent electric lamps. Telephonic communication will be laid on not only to the general system, but into each of the Courts of Law.

Mr. William Wimble, of 9, Queen Victoria-street, and Mr. Goymour Cuthbert, A.R.I.B.A., of 15, Walbrook, are joint architects. Messrs. Ashby & Horner, of 8, Aldgate, are the contractors, and Mr. Brady is clerk of works.

ADDITIONS TO A FACTORY AT NORTHAMPTON.

THE plan shows a portion of the additions and alterations now being carried out for Messrs. Birdsall & Son, bookbinders, Northampton.

The principal object in arranging the plan has been to facilitate intercommunication between several departments, and to economise the supervision. These are necessarily great in a trade full of minute details and with much subdivision of labour; therefore every available bit of ground has been utilised up to the boundaries of the property, so as to get as large an area as possible on this floor, and to admit of several branches of the work being in close communication with each other. This, of course, necessitated top lighting, and the roofs are arranged to run as nearly as possible east and west, securing a clear north light throughout this part of the factory. The south sides of the roofs, which are covered in with slates, have an air space between the match-boarded ceiling and the rough boarding, with the object of checking the extremes of heat and cold.

The ironwork in roofs has been carefully calculated, so that whilst each part is fully strong enough to do its work, there is no waste of metal. The principals are constructed entirely of T and L iron fixed together with plates, rivets, and bolts, as shown on the details, and the valley gutters are iron troughs running the whole length of the building, and large enough for a man to get along.

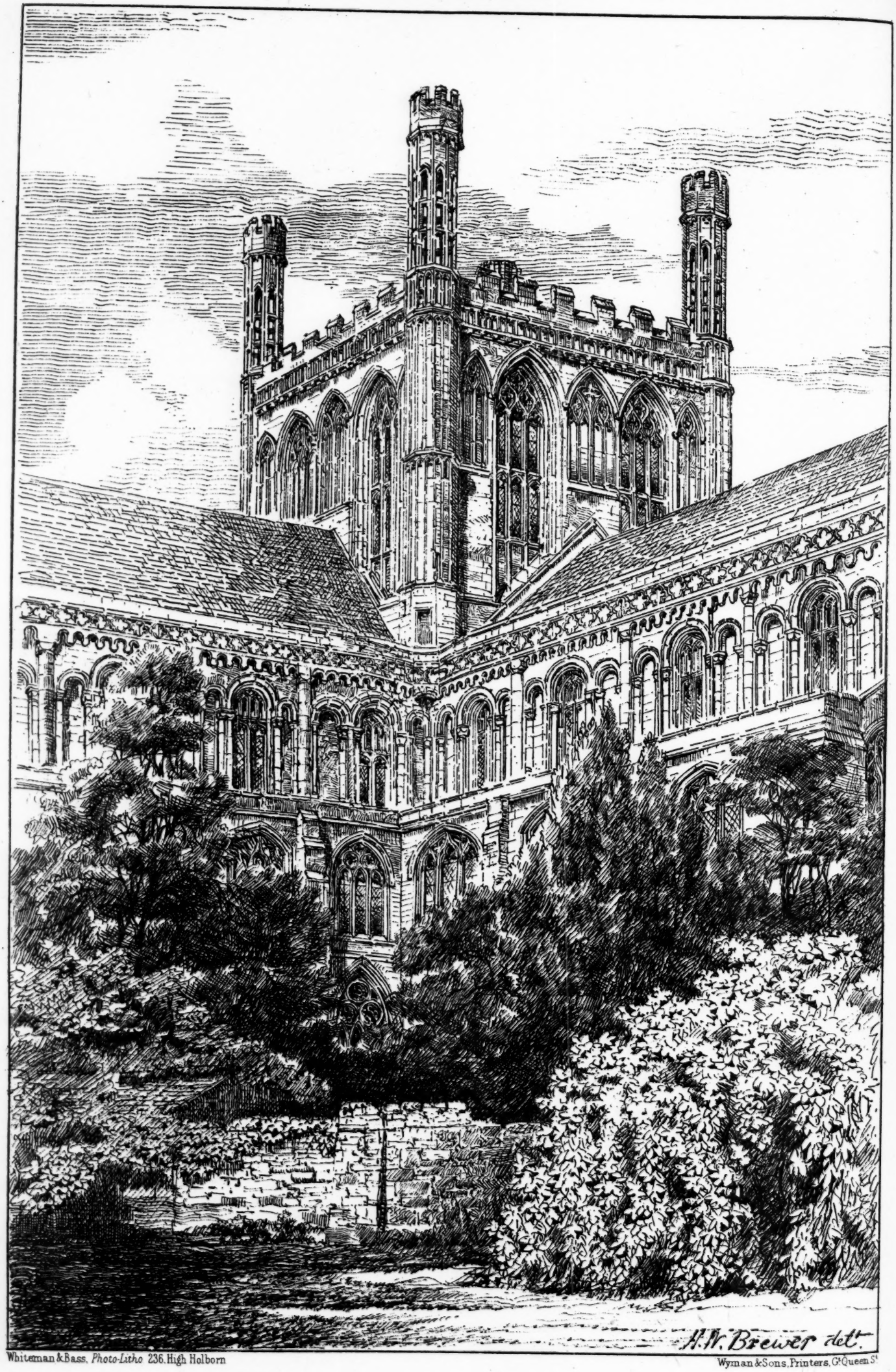
Louvre ventilators, with inside shutters to check down-draught, are provided in each of the hips, and also in the brick gables. The floor is boarded throughout, with the exception of the glue-room, which is paved with York slabs.

It is intended to heat the whole of the buildings with hot water.

The general contract has been taken by Mr. G. J. Fisher, of Northampton, for 871*l.*; the ironwork in columns, girders, principals, &c., by Mr. H. Mobbs, of Northampton, for 335*l.*; and the patent glazing by Mr. T. W. Helliwell, for 138*l.*

The architect is Mr. Thos. Garratt, 19, Queen Anne's-gate, Westminster, S.W.

CHRIST CHURCH CATHEDRAL, DUBLIN: VIEW OF NAVE, LOOKING EAST.



Whiteman & Bass, *Photo-Litho* 236, High Holborn

Wyman & Sons, Printers, G^t Queen S^t

PETERBOROUGH CATHEDRAL: TOWER AND CLEARSTORY.

C.F.Kell, Photo-Litho. Castle St

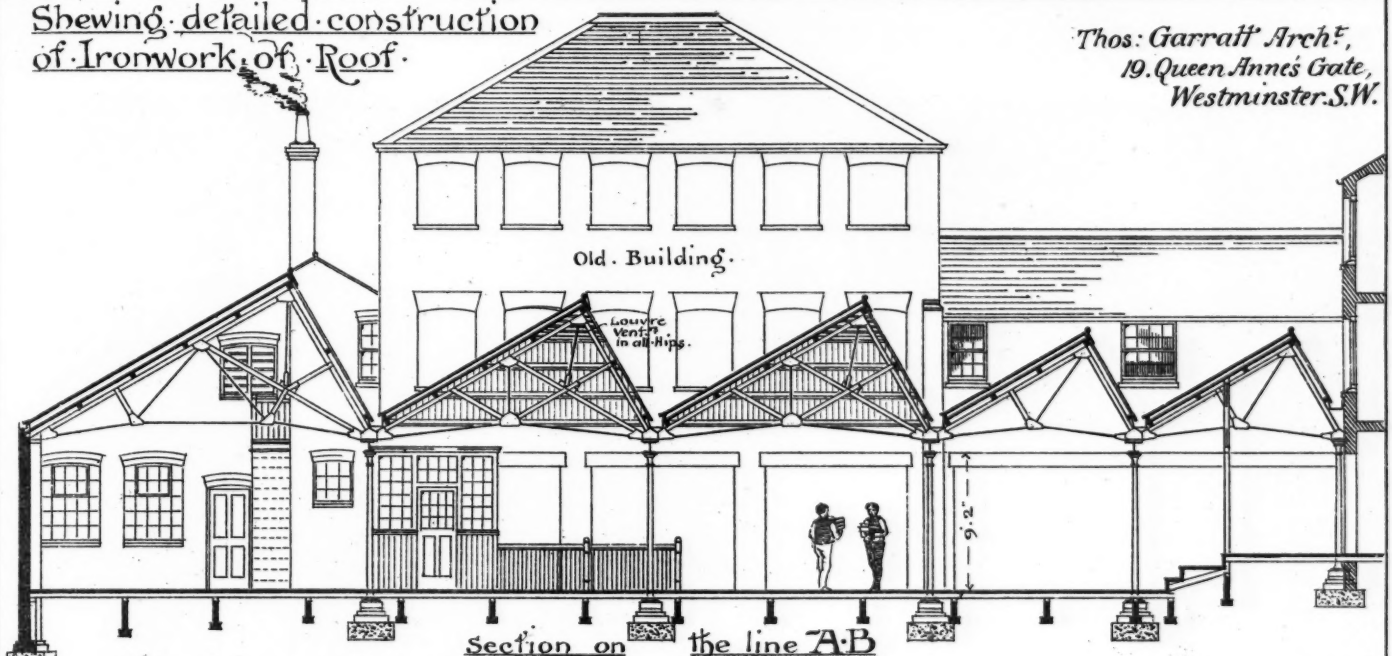
Wyman & Sons, Printers.

ROYAL COURTS OF JUSTICE CHAMBERS, STRAND.——Mr. William Wimble and Mr. Goymour Cuthbert, Architects.

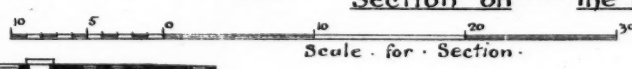
Additions to a Factory at Northampton for Messrs Birdsall & Son.

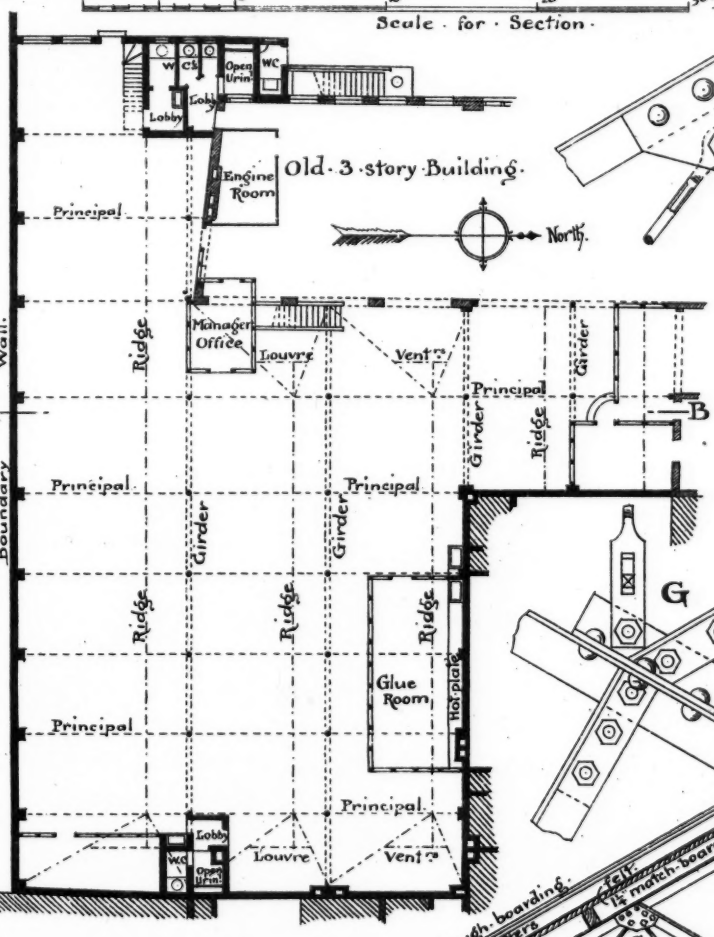
Shewing detailed construction of Ironwork of Roof.

Thos: Garratt Archt,
19. Queen Annes Gate,
Westminster. S.W.



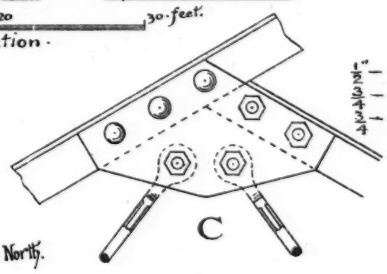
Section on the line A.B

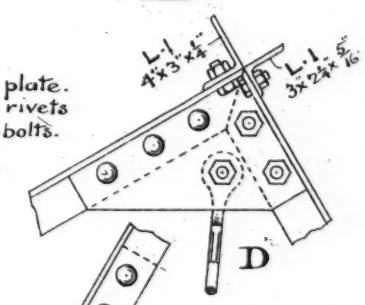


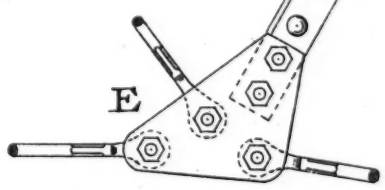


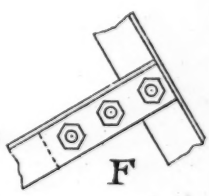
Ground Plan.

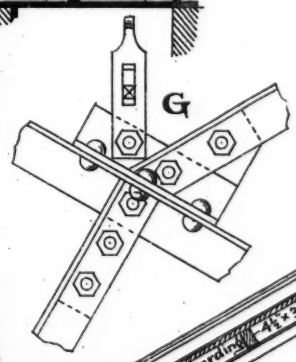
New Buildings black.
Old ditto hatched.

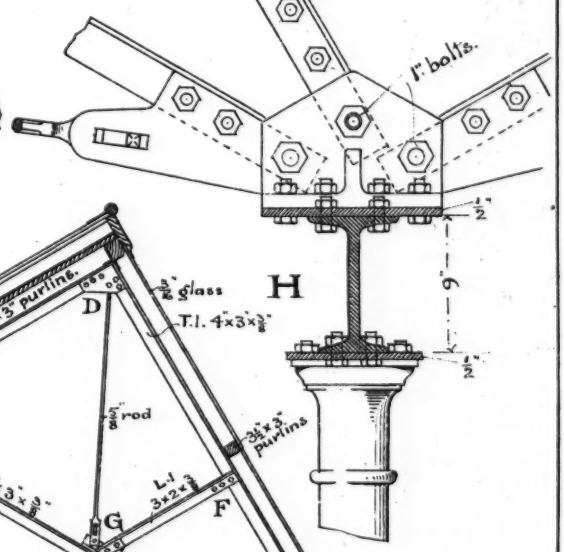


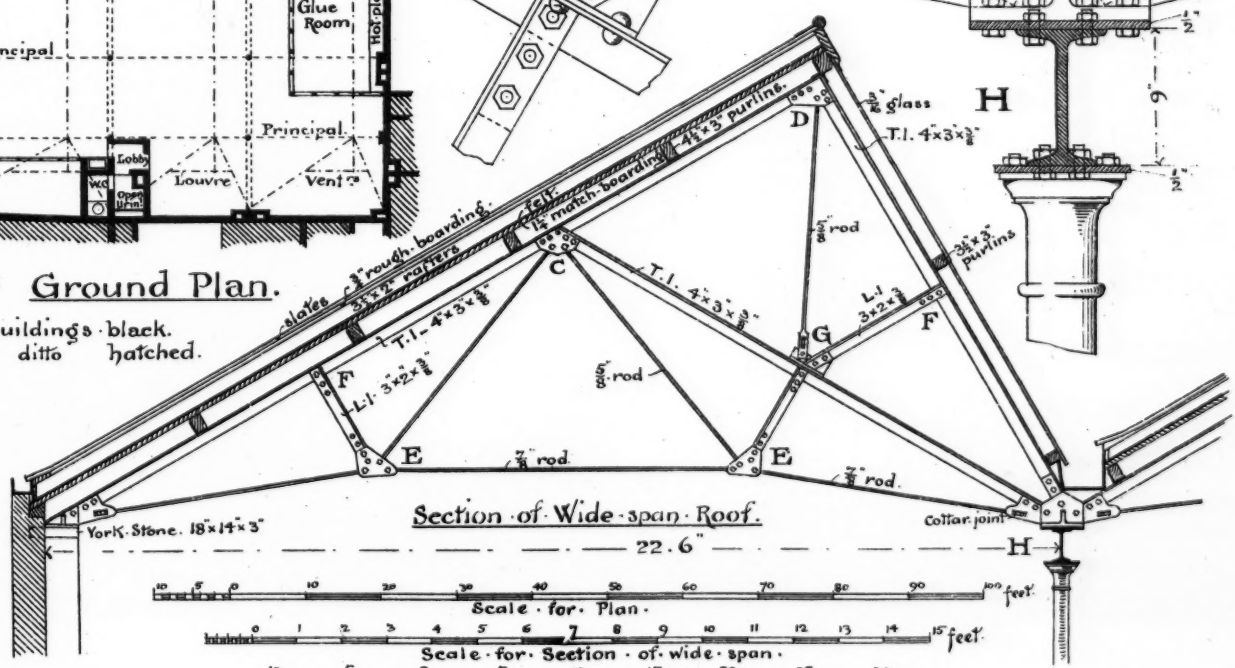




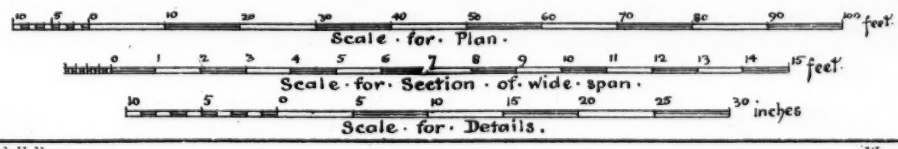








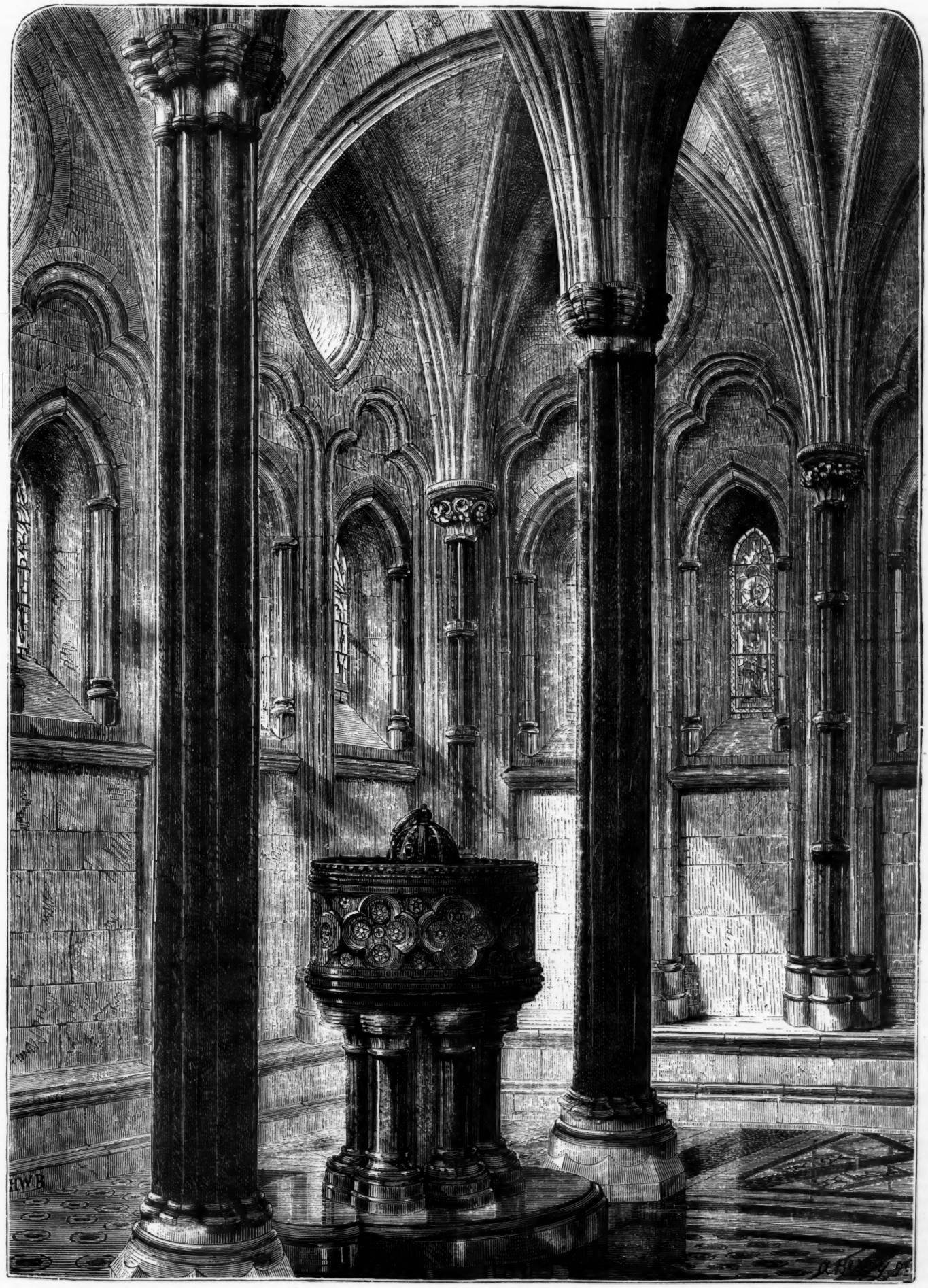
Section of Wide span Roof.


10 5 0 10 20 30 40 50 60 70 80 90 100 feet.
Scale for Plan.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 feet.
Scale for Section of wide span.
10 5 0 5 10 15 20 25 30 inches
Scale for Details.

T.G. delt. Nov. 1882.

Whiteman & Bass, Photo-Litho. 236, High Holborn

Wyman & Sons, Printers, Gt Queen St.



CHRIST CHURCH CATHEDRAL, DUBLIN: INTERIOR OF BAPTISTERY.

THE ORNAMENT OF THE PERIOD.*

SOME objection may fairly be taken to the title which I have chosen for the subject of this evening's talk,—the Ornament of the Period! What is it? Well, sometimes it is Greek, sometimes Roman, sometimes Mediæval, more or less ingeniously done anew. It may be of the sixteenth century, or the seventeenth, even of the eighteenth,—in fact, of any century but the nineteenth, of any period but that in which we live. So emphatically is this so, that we might fairly say that the one thing certain about the ornament of the period is its non-existence. But that is only half the truth. Equally true is it that something of us and of our time must be embodied in the work we do; and even if there were no other quality about it appertaining to us, it would betray to the "coming races" its nineteenth-century date by the very simulation of earlier periods which belongs distinctly to our age.

It is rather a remarkable circumstance that all this repetition in which we indulge is done in the avowed honour of old work, in which there was scarce ever a trace of any such thing as the attempt to reproduce the past. The men who did the real, good, old work were men wise enough in their generation to let by-gones be by-gones, and yet we think to do them honour by doing just the opposite to what they did, and what they themselves would heartily have abhorred. Whenever we repeat the forms invented by them there is all the difference between our work and theirs that there is between invention and mimicry, between reality and affectation, between life and galvanism. I said that the ornament of the period had some character of its own; but it is a character more honoured, to my thinking, in the breach than in the observance: what distinguishes nineteenth-century ornament from all other is its insincerity, its unreality. I have no wish to dogmatise, and no intention of decrying those who may feel differently from myself. It is quite possible for a man to be so deeply imbued with the art of a past period that it comes naturally to him to express himself in its language. And we could ill spare the utterances of some of these men. Indeed, the very affectation of a sentiment argues the existence of the sentiment affected, as surely as smoke betrays the presence of fire. But the men who live in the past are not, and in the nature of things cannot be, the majority; nor yet are they the true exponents of this age of ours. Perhaps we may even be permitted to bear them some slight grudge, inasmuch as they are in a degree responsible for the affectation of the feeling which really inspired them. Anyhow, that affectation has grown apace in recent years, and it would scarcely be too much to say that it has choked the growth of genuine design among us. Surely that is a serious cause for quarrel with it. The student is taught from the beginning to lisp in a tongue that is foreign to him. Some liberty of selection is, indeed, allowed; he may choose the dead language in which to express himself; but it must be dead,—that is the one restriction. The sin unpardonable is to indulge in a natural ejaculation. It is time to rebel against such bigotry! What right or reason is there in it?

> "Why should I say I see the things I see not?
> Why be and be not?
> Show love for what I love not, and fear for what I fear not,
> And dance about to music that I hear not?"

If, indeed, the music of the past charm your ear and incite you, frisk away, by all means, to the tune of "Auld lang Syne"; but the mischief is that we are expected to dance about to music that is mute to us, and a sorry figure we cut. There is something infinitely ludicrous in the notion of the members of a serious and sedate profession moving in steps stately or grotesque, as the case may be, to a music so far off that not even the echo of sound reaches our ears. We might forgive them that, and even enjoy the fun of it, if only we believed that they themselves moved spontaneously to a measure audible to their more delicate nerves alone; and if they say that they hear it, we are bound, even though their movements be not rhythmical, to believe them, however inconceivable it may be to our grosser senses. But when they would compel us to join hands and mingle in the fantastic dance, then it is high time to speak our minds; and even if we protest somewhat strongly, there is some excuse for strong language. No one will be at the pains to deny that the essays in style, which constitute the greater part of modern architecture and ornament, do to a certain extent exercise the faculties of the student; but it does not follow that education of a different sort would not have developed them to a much further degree. We may acknowledge that the Latin verses which absorbed so much of our time at school were not without influence on us for culture, without denying that our time might have been very much better spent than in writing doggrel in a dead language; and whatever may be thought of the study as a sort of intellectual gymnastics, calculated to develope and strengthen the fibre of the brain, no one contends for the verses themselves that they are anything but exercises; neither have our ingenious experiments in Classic, Gothic, or Renaissance style any just claim to be more than exercises. They stand to art much in the same relation as did our boyish Latin verse to poetry. Now and again, a poet, like Gray in the last century, or Landor in this, chooses to express himself in a tongue that can appeal only to the learned few; now and again a painter sees fit to express himself, so to speak, in the language of learning rather than of art. Such men may be poets, indeed; but if they decline to use the vulgar tongue, they have no right to look for the appreciation of those who know no other. And if an artist choose to masquerade in the guise of an antiquary, he has none but himself to blame if he be mistaken for something less than an artist. There is some satisfaction, to my mind, in the certainty that the artist, of whatever class, who poses as an antiquary, does, by so doing, shut himself out from the sympathy of his contemporaries. The number of the public who really care two straws about style is infinitesimal. They are certainly not enough to keep a profession going. And, since it is ultimately upon them that the bread of the artist depends, the prospect is not quite so hopeless as at first sight it would seem. The artist may be starved into sympathy with his age. Not to speak of the public at large, I cannot bring myself to believe that the main body of architectural students really feel that the expression natural to them is that of the thirteenth, sixteenth, or any other century than our own. Such a state of things could be explained only on the supposition that those alone who had archæological tendencies were attracted to the architectural profession. The student soon comes to appreciate the value and beauty of style in old work, but the one idea associated in the mind of the general public with styles and periods is that any one of them in itself is monotonous and wants the "relief" of some other style to "set it off." An example of this popular notion, familiar to all, is afforded by the type printer. He is a flagrant instance in point. Give him a simple title-page or prospectus to print, and he will set it up in types of as many different periods as he can possibly manage to introduce,—"displaying it," I think he calls it,—and a pretty display he makes of his ignorance. Between such ignorance and the pedantry of the purists, surely there must be some course open to a man who acknowledges to himself that he belongs, not to some generations after his time, but to his own day. It is curious how the public have allowed the style of this period or that to be fastened upon them, caring in their hearts about neither one nor the other. Had they cared, they would not have submitted so easily,—certainly they would have hesitated before allowing the deposition of the reigning sovereign in favour of the ghost of Queen Anne. They had always just a suspicion of their own deep ignorance of the subject, and dared not, therefore, follow any fancy they may have had for this or that. Their most potent impulse (if that may be called an impulse which is only a fear) was and is the dread of singularity. Safety there is, of course, in holding on always to the skirts of the past; but it is to be hoped that there is more of the spirit of art militant in us than that we should rest content with the laurels (dried ones) other men have gained in other days. It was by no such timidity that they won their wreaths. And if cowardice is to be considered as a characteristic of modern art, the sooner we throw up the sponge the better.

Of course we owe our possibilities in a great measure to the labours of the archæologist and antiquary. It is they who bridged over for us the gaps between the periods of art and our own day; but we have already paid a heavy price for the accommodation, and artists can scarce help feeling that the time has come when the toll should be abolished. The high road to excellence should be open to all men. The sad and serious side of the question is that so much of the modern work which does not affect any fashion of past art shows a hopeless ignorance of style altogether,—an ignorance, indeed, of what style is. There are such abundant instances of ignominious failure to which the adverse critic could point and say,—"Is *that* the kind of thing you advocate?"

We will not speak of architecture proper, for that might be difficult and delicate ground to go over. But think for a moment of the productions of the uneducated draughtsmen who boldly rush in where architects fear to tread, and furnish nondescript designs for all the miscellaneous wares which fill the fashionable, fashion-fostering shops, and flood the world with rubbish. The thought is enough to make us tolerant even of the intolerable vice of pedantry. There is a class of workmen who think that to put a fret border round a panel will make it Greek, that you have only to flatten out a sprig of foliage to make it Gothic, and that if you start from one corner, and only partially occupy the space, it is, without more ado, in the manner of the Japanese. They have a notion that originality may best be displayed by piecing together scraps of all styles under the sun. They think that the forms are the style, and have no conception of the spirit underlying old work. This is not exaggeration. The confusion of ideas in the public mind as to what constitutes style is a tangle as dense as one can imagine. And this applies to those who ought to make it their business to know better, and who are, in fact, purveyors of bad taste to the public. I have before now been asked to design a stained-glass window in which the central subject was to be a group of flowers, as naturally treated as might be, surrounded by a border in imitation of a Persian carpet. The question may seem to you to be beneath the consideration of the architect, but indeed it is not a matter of slight importance to any one who believes at all in the use of art. Recollect the enormous power in the hands of a single ignorant or interested person of propagating what is, artistically-speaking, monstrous. I was asked not long ago to furnish a new design for the binding of a popular periodical, and I took some interest in doing it. Imagine my disgust when I found it had been produced in the crudest conceivable shade of a colour which it would be cruel to call violet. I am afraid to say how many tens or hundreds of thousands of these abominations it was proposed to distribute over the country. Happily, the bookbinder for whom I was working was a man of taste, and the publisher was not altogether unamenable to persuasion, so that eventually only a portion of the volumes, I believe, were issued in the objectionable colour, but every one that was so issued "made," as Mr. Matthew Arnold would express it, for the demoralisation of popular taste.

Now the fact (which I have admitted) that most of our attempts to run alone end in disaster is no argument for resting content to cling for ever to the apron-strings of our nurse. We are none the worse for the bumps and bruises that followed on our first childish attempts to walk alone. And neither will art in the end be the sufferer, but very greatly the gainer, by some venturesomeness on our part. What a delight it is always, in old work, to see where the artist has dared something, and how interesting all transition work is, from the very circumstance that you never quite know what will be the outcome of the meeting of old and new influences. Think of any one of the great cathedrals that have grown to what they are,—where Norman pillars support Gothic arches, and Decorated chapels cluster round an Early Gothic apse; whilst the nave is lighted by windows of Perpendicular or Flamboyant type; and maybe the portal shows traces of Renaissance influence. How deadly dull it would all have been if the successive generations of artists, through four or five centuries, had felt themselves called upon to play at "follow my leader." How dull it *is* where now and again the old men did hark back to a past period,—as in the case of the cathedral at Orleans, reconstructed after 1600, in a style that may best be described as galvanised Gothic. Happily, in-

* A paper by Mr. Lewis Foreman Day, read before the Architectural Association on the 19th inst.

stances of the kind are not numerous; for the most part, the men of former centuries knew how to graft their own living style on to the old stock in a way that is more than satisfactory. Many of you are, no doubt, familiar with the west front of the cathedral of Bourges. The arcading of the lower wall suffered some dilapidation, and it was necessary, early in the sixteenth century, to repair the mischief. The question was, How? The original arcading was of the thirteenth century, with trefoiled arches, the capitals (and spandrels, too, if I remember), enriched with the usual Early French foliated ornament. It would have been absurd to pull down the old work and build it all anew,—equally absurd, as they thought, and as modern architects do not appear to think, to copy in the new work what remained of the old. And yet unity of effect was bound to be preserved somehow. Their solution of the problem was characteristic, and as simple as Columbus's egg. They just accepted the old lines of the arcading, and filled them in after the manner of the days in which they lived, and in which they were accustomed to work. We have thus an arcade of Gothic arches, with carved enrichment of Renaissance design. The general effect is perfectly harmonious and undisturbed. Only when you come to look into the ornament do you become aware that it has individuality of its own, instead of being a cold copy of the earlier work. It is a bit of history, in fact, and the more interesting accordingly. Its occurrence in this stately front is as welcome as one of those traits in the life of a great man which show us a glimpse of his personality, and reveal his relation to ourselves.

You may say that we have now no style in which we are accustomed to work, and in which it would come natural to us to repair or add to an earlier structure, and that is true enough (and the more we rely upon copying the less likely are we to form a style); anything we do must naturally partake, more or less, of the character of old work; and, in the case of restoration, of the character of the particular work to be restored. The mistake, as it seems to me, lies in attempting always to make it as much as possible like old work, imitating wherever it is practicable existing details, and seeking before all things for a precedent. Let us leave precedent to the lawyers and not attempt to measure art with red tape. We know what a mess the lawyers make of it when they meddle with art. The first thought of the artist should be rather to make his work in harmony with the surrounding old work than absolutely like it; and, that much secured, the more of himself he can put into it the more interest it will have for his brother artists. Except for the evidence of the artist's personality in it, none but the most perfect of perfect work would be tolerable. Is not that an argument in favour of work that, poor as it may be, is our own? The old workmen showed that it is possible to be oneself in any craft of which one is master, and if we cannot do so much the more shame for us. Let me not be misunderstood to mean that the artist should ever consciously strain after originality. The evidence of such an attempt on his part is a symptom almost more unpromising than the inertia that is content to let things be, be what they may. Once in the past such an attempt was made, and on a considerable scale, when the Jesuits had the notion of inventing an ecclesiastical style of their own, and a fearful and wonderful order, or disorder, of architecture, it was that they devised. There is at least one advantage about its uniform tastelessness, namely, that the student knows, almost for certainty, that the church of the Jesuits will have no attractions for him; and he can safely save himself the trouble, therefore, of turning aside in search of it, or even of crossing its threshold if it chance to lie in his way. The only case I know of in which he would miss anything is in the Church of the Jesuits at Venice.

Originality and individuality will surely come out in a man's work, if only he be free to do what he thinks befitting the occasion, instead of being bound to do as was done on some former occasions. It may well be that the solutions other men may have found for their difficulties, may go far towards the solution of the difficulties that confront us. But the world goes on and not backwards, and to restrict ourselves to the repetition of what has been done is deliberately to put the drag upon progress. There may be no great harm in that sometimes; for the progress of civilisation is uphill and downhill, and there are many chances of disaster on the road to improvement. Still the drag is only for occasional use: it is not a means of progress. And if we want to get on, we must rely, not so much upon the old vehicle, as upon the use we put it to, and the faculties to which we harness it. To drop the simile, it seems to me that we have, indeed, to possess ourselves of the accumulated experience of the past masters of our craft, and to *use* it. To stand helpless before it in the attitude of admiration, or to pile it up across our path, so that it shuts us in from doing, is equally futile. It should influence us in all our efforts as live religion influences our every act. We should refer to it in every emergency, almost unconsciously, as to our conscience. If, in designing, we were determined to give up our minds to the best possible solution of the problem (and every design *is* the solution of a problem), we could not solve it without reference to the knowledge which we had acquired from the study of old work. That, therefore, may well be left to take care of itself. Were we to dismiss, on the one hand, all thought of style (which is impossible), and on the other, all thought of self (which is perhaps no less impossible), we might, having, on the one hand, some knowledge of style, and, on the other, some individuality of our own, arrive at a result worth reaching. What we have to think about is neither style nor originality, neither as to which was the oldest, nor which will be the newest way of doing the thing, but how we best can do it! Of course, we must study old work, and study it with all the earnestness of enthusiasm. And, equally, of course, we cannot forget in what we do the styles which went to teach us how to do it. In fact, what we have to do is to digest our learning. Art may be, and architectural art and all that pertains to it must be, nourished to a great extent upon antiquarian research; but undigested archæology is, nevertheless, not art; and whenever the archæology asserts itself in our work it is a dangerous sign. If you can pick out bits in a design, and say this was inspired by the nave of such a church, that by the choir of such another, that by the west front of a third, and so on, it is clear that the artist who is responsible for it has not digested his knowledge. There is less danger of this want of homogeneousness where some one fixed style is adopted and adhered to rigidly. Inasmuch as there is a certain unity in the original style, there will be a certain similarity in the bits put together; and that may be reason sufficient to the prudent man why he should restrict himself to a style that is stiff and stark. But his work will not be really *one* unless he has assimilated what he has learned. It must have passed into his blood and into his brain before he can claim it for his own. Once it *is* his, he can do pretty much as he will with it. He can combine then, only then, what he may have gathered from the most various sources. I believe it is quite possible for him to produce work, in which, indeed, you may detect the influence of different styles of art (as you may trace in a man the instincts he has inherited from various ancestors), but you cannot say where the one influence ends and the other begins; you cannot pick out this bit for Greek, that for Gothic, that for Japanese; you are driven to describe it at length, or to coin a word for it. The subtlety of the art may be tested by the difficulty in labelling it, just as a subtle tint of colour cannot be exactly expressed in a word.

When a style is no longer elastic it is proof that it is dead. No style, while it lived, was ever the cut-and-dried thing we begin by imagining it to have been. There was always change, development, growth going on,—and when we confine ourselves, therefore, to the letter of a past style we inevitably lose its spirit. The more you study old work the more you see the wonderful variety in it. The types of the text-books are among the best, no doubt, but they are only instances of types that exist in infinite variety in the old work itself. The freedom, for example, with which the Greeks carved natural foliage is a characteristic of their work which we are left by our teachers to find out for ourselves. There are in the Louvre examples of Greek foliage that seemed to me to have more affinity to Japanese treatment than to anything I was ever taught to accept as Classic. Is not this fact, by the way, suggestive as to the possible infusion of Japanese energy into Greek detail, the possible refinement of Japanese forms to something like Greek perfection? How readily the artists of the Renaissance accepted the Eastern types of ornament into their own style, and assimilated it! You see it in the bulb-shaped domes of Padua, all the more beautiful for this foreign flavour about them,—and in certain of the arts, such as damascening, inlaying, book-binding, and others, the Eastern character of the detail is quite a marked feature of sixteenth-century ornament. That type of Italian scroll-work which Holbein afterwards developed in a manner more of his own, is little more than a characteristically European rendering of details borrowed frankly from the East. This readiness of the men whom we acknowledge to be our masters to embrace within their art whatever was beautiful, is something far more deserving of emulation than the actual forms of art which resulted from that broad catholic spirit of theirs, a spirit which we only mock with little sectarianism!

I have sometimes amused myself by imagining what might have been the effect upon the artists of the Renaissance of a familiarity, such as we enjoy, with Japanese art. It would have been a sort of revelation to them, as it was to us. What use would they have made of it? They would certainly not have been content, as we have been, to import it and to copy it. They would surely have learned something from it, and as surely they would have turned the lesson to account. They would have learned, perhaps, to doubt the necessity for elaboration in ornament, and for that absolute symmetry to which they were inclined.

There is a fund of interest in observing how different nations interpreted a style differently, and the study of their different interpretations cannot but throw some light upon the course we should pursue under circumstances not altogether different. The Renaissance was a trying back, as we are trying back in the present day; but there was not much in common between their free departure from Classic art and our servile acceptance of forms that have not the slightest claim to Classic perfection. And, if the Italian Renaissance was not just a repetition of Classic details, neither was the Renaissance in France a literal version of the Italian, but a rendering essentially French, and allied (not remotely) to Late Flamboyant-Gothic. How the Spaniards enriched the style with a glow of Oriental sumptuousness! There is nothing more gorgeous belonging to the period than is to be found in Spanish and Portuguese art. In the hands of the Germans the forms hardened and assumed a grotesquerie foreign to the South. Even the English of the reigns of Queen Elizabeth and James anglicised it almost out of knowledge, and worked out a style, such as it is, which is unmistakably their own. And, again, in Norway and Sweden (not to follow it further) the characteristic strap-work blossomed, under the new influence, into floriation of a Renaissance, yet none the less Scandinavian, character.

In Italy, to return to the fountain-head, the Saracenic influence goes, in some directions, so far that it was not uncommon in the sixteenth century to introduce mock Arabic inscriptions into the design of textile fabrics. There was no great display of genius in that. It would certainly have been better if they had merely taken the hint given by the admirable ornamental use the Moors made of inscriptions, and put their own mottos into their own language in a form as ornamental as might be. But their work as it is has at least more interest for us now than if they had merely reproduced in silk or velvet some altogether Eastern stuff.

The style that is really worth striving after is the style that comes of characteristic and craftsmanlike treatment. It is infinitely more important that our building shall be like brick or masonry than that it suggest Gothic or Classic examples. It matters more that it should be constructed on principles of common sense than on the lines of old work; that it should be comfortable than that it should be "correct," whatever that may be; and that it should be beautiful than that it should be such as might have been built in the reign of any king or queen defunct. And so with all the lesser arts. The style that comes of workmanlike handling is worth far more than anything that can come of imitation. Why there should be any limit to our scope other than our own powers of expression and the fitness of the occasion, it is difficult to conceive. Say we accept thirteenth-century design as our starting-point, and propose to speak on that text, are we to borrow our sermon also? What we have to say on that subject will, if we are artists, naturally

take artistic shape in our hands, and it will shape itself in harmony with the subject. We may say what is in us to say, and quote what we please. If the quotation comes amiss it is the fault of its clumsy introduction,—whatever is apt is admirable. If something from Japan or Timbuctoo suggest itself to us as being in harmony with our design, what is to hinder us from adopting it? If we see an opportunity of infusing into it something of Renaissance grace, why not? If we feel that we can accommodate it to modern requirements in a way that was undreamed of by the Mediæval artist, why not? Any faults we make, and many they are, lie in our inefficiency and not in the endeavour. And the only sense in which it is true that we ought not to attempt so much is that we should not try to run before we can walk, but we ought all to look forward to the time when we can march onward on our own account, and not fancy that all we have to do in life is to toddle through the world.

There are many and various definitions of what style is, but practically what is accepted among architects and others as style is always a distinct reflection, if not an actual repetition, of the features of some past phase of art. There is proof of that in the names by which we christen our modern work. It is always Classic, Gothic, Renaissance, or what not, and even the latest-born of mongrels we must needs baptise by the name of Queen Anne. If by style we really meant treatment according to the principles which experience has shown to govern this or that branch of art, we should express it in our nomenclature, and classify styles according to craftsmanship rather than according to date and country. Thus, for example, instead of Egyptian, Greek, and Gothic architecture, we should speak of construction in granite, marble, or stone, and, in like manner, brick, stucco, and even concrete, would be credited each with a style of its own. We should classify metal work, not according to an epoch, but according as it was cast and chased or wrought at the anvil. Constructive woodwork would divide itself into carpentry and cabinet-work; its ornamental treatment into carving, turning, inlaying, and the like. The study of style would then be identical with the study of an art or craft, whatever it might be, and the student's attention would be drawn rather to the steps by which it had advanced to its highest point, than to the comparatively accidental character of its footprints by the way. Such study would naturally include the knowledge of any marked impression made upon the art by the influence of the day, and the course of the student would lead him gradually through all the phases of fashion through which it had passed. His faculties would, moreover, be strengthened by this comparative study of all the many stages of his art. He would not compare the one with the others without forming some distinct notion of his own as to which of them was of most vital importance to himself. His thoughts would be concentrated upon the essential fitness of things instead of on the unessential forms that they from time to time assumed. If he did not thus acquire a style more or less of his own, he would, at least, fit himself to meet any and every emergency. The knowledge he had acquired would be neither sentimental nor pedantic, but practical and available, whereas half the learning of the present schools is altogether unavailable for any professional purpose. There is a use, no doubt, in the book-learning that makes a man something more than a craftsman; but, when all is said, the true study-place of the artist is in the workshop, and his best education is in working day by day to better purpose and to higher ends. There is a kind of culture, altogether apart from daily work, that throws a glow of refinement over all we do; but infinitely more ennobling is the cultivating influence of the work itself, and that cultivating influence is in proportion to the breadth of view, the freedom of action, and the possibilities of progress offered by that daily work. The natural growth of the artist is from craftsmanship to art, and many are the craftsmen who have risen in their day (not in ours) to the foremost rank in art. On the other hand, experience shows that the step from learning to accomplishment is not an easy one, and those who begin by knowing all about a craft seldom end in accomplishing anything in it. A man is much more likely to arrive at a knowledge of Gothic principles from the serious study of architectural sculpture than to reach any proficiency in carving *after* he has mastered the theory of Gothic art. To say that the two studies should progress side by side, is to beg the question. They cannot possibly keep pace for ever. One must gain upon the other. Then, which should have precedence? I contend for the growth upwards, from craftsmanship, and do not believe a bit in the growth downwards, from archæology. Culture is the climax of all art, an ideal towards which to strive; it is not a starting-point at all, and your young Crichton, equipped at the onset with all possible culture, never does anything in the world whatever. It seems to me that our education starts too much from the platform of knowledge and not enough from workmanship. The beginner is taught to know and not to do. He knows, for example, more about style than he can assimilate, long before he can do anything worth mentioning. The future architect can talk architectural jargon before he can so much as contrive a substantial pig-stye. The student of decoration can *talk* familiarly of epochs and of masters before ever he can draw a scroll, not to say design one. Would it not be more to the point to teach the architect first of all to construct, the decorator to draw, calling their attention to principles only as they affected what they were about? As for style, in the historic sense, that, too, might safely be left till, in the natural course of study, he came to known how the difficulties besetting his craft had been successfully solved in the past. In this way he would not grow up with an inordinate reverence for some one phase of past art. Nor yet do I believe that his work would be destitute of style, in the larger and truer sense of that much-abused word.

I started by saying that if a man be possessed by a passion for any one phase of art he must follow that phase, — he cannot help it,—and I do not see why he should. He will give us his best by pursuing it. And if a man find that he can work best in harness,—well, every artist must go his own way to work. Some prefer the beaten road, and some like to feel the turf spring under their feet. What I wish to protest against is the assumption that those who feel that the exigencies of style only trammel them, should allow it to do so, and hinder the free development of their powers. With the knowledge that we have, we must, for the most part, perhaps, start from the standpoint of some existing style (not that I think even that absolutely necessary), and I blame no man for restricting himself even to what has already been done in that style, if it comes natural to him to speak in other men's words, and all he has to say can be so expressed. My sympathy with him would be greater, however, if he proposed to himself to work rather in the spirit of that style; for then he would be a good half-way towards independence. In attempting to follow the spirit of a style, he allows himself to interpret what *is* the spirit, and in that interpretation any man may well find scope for all himself. Personally, I think that any given style is mainly useful as a point of departure, and I feel myself justified in going as far away from it as ever I please, so long as I come round in time to the point from which I set out. I consider nothing inadmissible which is in harmony with my purpose, and if the whole be in harmony I care not who may say that it is not Classic, that it is not Gothic, that it is not Renaissance, that there is no authority for this, no precedent for that. If only it be fit and beautiful, who but a pedant cares for precedent and authority? Those whose precedent we pretend to follow would have had no authority whatever over us if they had merely followed feebly in the steps of bigger men who went before them. No doubt, fitness and harmony, in defiance of precedent, are infinitely difficult of attainment; but the ideal is worth trying for, at the risk of all failure. And there is hope for all who try,—not, perhaps, that they will do anything better than what has been done already, but that they will help to make it possible to be done in the future. They have, at least, the consolation that they are trying to help things on a step (however short a one), instead of gently rolling them back. With all their efforts they may not do much good. They may do some harm; but by resigning themselves to the mere repetition of old forms they may still do some harm, and they cannot do much worth doing. The satisfaction of the purist is not the loftiest aim in art. It has been said of modern religious paintings that they never offend against good taste, for they never aim at auything higher; and in like manner it may be said of those artists, whether architects like you, or ornamentists and decorators like me, who set themselves to task to satisfy the purist in style, that they will do so only by abandoning all hope of individual expression. Any personal utterance would be sure to tempt them from the path of virtue, as the purist understands virtue.

In conclusion, let me repeat that the main cause of complaint against the ornament of the period is that it is as little of the period as it can possibly be. It betrays its date, indeed, but for the most part unconsciously, and in spite of its self. As far as it can it denies the generation to which it belongs. For my part I am not ashamed of the century in which I live; and, though perhaps there have been ages more favourable to the development of art, our only chance of doing anything is to go with the age, and to let ourselves go, looking forwards always, not backwards, and if that implies that we must burn our ships behind us, well, the men who mean to go on are not afraid of that on occasion. One word of postscript. It would have been hopeless in the short hour at my disposal to think of teaching you much, but one may suggest a good deal in a short space of time. With that idea I have simply let myself go to-night without considering too carefully whither my thoughts would lead me. I do not pretend to have given more than a partial statement of one side of my subject, and I know full well how much remains to be said on the other. I have spoken out in the hope of stirring some among you to think over the ornament of this period of ours (it is what we make it), and whether my words stir you to sympathy or to opposition, is of less consequence than that you should think, and think for yourselves.

ARCHITECTURAL ASSOCIATION.

AT the ordinary meeting of this Association, held on the 19th inst., Mr. E. G. Hayes, President, in the chair, the following gentlemen were elected members, viz., Messrs. E. J. Lines, E. G. Salter, A. J. Cooke, J. S. Thomson, C. H. Cooper, J. M. Geden, H. F. Tomalin, H. J. White, J. E. Inglis, S. E. Piper, A. Lines, H. P. B. Downing, and J. K. Harker.*

The President announced that the Sketch-book Committee had awarded the following prizes, as recommended by the Architectural Association Prize Sub-Committee Judges (Messrs. T. Batterbury, C. Henman, and A. White), viz.,—prize of 5*l.* 5s. for the best design for a title-page for vol. ii., to Mr. William Leck. Prize of 5*l.* 5s. for the best set of five transfers contributed by any member to vol. ii., to Mr. Leonard Stokes. Prize of 3*l.* 3s. for the best set of three transfers, to Mr. Thomas Garratt. The committee have offered similar prizes to contributors to volume iii.

Mr. Eales, one of the hon. secretaries, announced that the first visit of the session to new buildings and works in progress would be made this Saturday, the 27th, to a new house recently built for Dr. Hogg at Bedford Park, Chiswick, Mr. E. J. May, architect.

Mr. Lewis F. Day then read a paper on "The Ornament of the Period," which we print in preceding columns.

In the discussion which followed,

The Chairman observed that the meeting had been favoured with an interesting review by Mr. Day of a great part, if not the whole, of the situation as regarded decorative art, especially as it concerned the architect. The paper was one full of suggestion for thought. With regard to all questions of taste, it was almost impossible to lay down any definite law, but there were many guiding principles as to which Mr. Day might be expected to speak,—such principles, for instance, as had been laid down by Owen Jones and others, as to the decoration of floors, walls, and ceilings, and as to which he believed decorators and ornamentists were for the most part agreed. In regard to most other points, however, whatever one did in the

* At the previous meeting, held on the 5th inst., the following gentlemen were elected members, viz.:—Messrs. E. A. Jollye, H. E. Evans, A. E. Marshall, E. W. Wimperis, L. Fraser, S. Rivett, H. C. Smart, A. F. Collot, J. Watt, W. Ainslie, W. H. Town, A. G. Hall, G. H. Greatbach, G. W. Russell, H. B. Youngman, C. O. King, A. Nicholson, J. H. English, F. Davies, A. Steinthal, E. J. Hall, E. Mackay, H. Riches, W. H. Ferguson, C. J. S. Hall, A. M. Butler, C. Dickinson, A. H. R. Tenison, E. A. Young, S. A. Ell, F. C. Ryde, J. Curwen, and F. E. Faithfull.

way of decoration would fail to please everybody. He was inclined to think that Mr. Day took a somewhat gloomy view of the situation. He drew an analogy between the position of architecture and that of decorative art. Well, architects knew well enough that they had no genuine style of their own in this nineteenth century, but he was inclined to think that the case of the decorative arts was not quite so bad as that. Indeed, he was inclined to think that the decorative arts were in a position ahead of architecture, and that more progress had been made in the decorative arts than was possible in architecture.

Mr. Stannus, in proposing a vote of thanks to Mr. Day, said he was very glad to hear his condemnation of the practice of straining after originality, so common a fault of young students, and which, as everybody who had experience in dealing with young men would know, was a real curse to art. It was, as Mr. Day had said, absurd for students of art to try to run before they could walk. Mr. Day had spoken very strongly against adherence to precedent. Now the Association had its Elementary Class of Design, in which strict attention to details was a *sine quâ non*. He took it that although Mr. Day had spoken so strongly against following in the footsteps of the past, he would not go so far as to say that the study of the details of old work was an undesirable study for the younger men. He had been very much struck by Mr. Day's remark about style growing upwards out of the material and the tool, for that was the element of truth in all styles; indeed, it might be said to be the origin of all styles. It was the more important that that should be said now, when anything like technical treatment of any material seemed to be well-nigh lost. At the present time we had wood-engraving treated as if it were steel-engraving, and in which, although one could not help admiring the immense subtlety of the work, it would be felt that the men who did it would do better as steel-engravers. Style was not to be confounded with the workmanlike treatment of the material. There had been much analysis of styles going on, but the question to be answered was, not what are the best styles, but what are the best treatments? Instead of trying to stem the current by becoming absolute purists, they should try to ascertain what were the best features of each style,—which were the fittest to survive? If they did that they would be gradually working towards a style which would not be any one style of the past, but which would be that rising sun to which Mr. Day looked forward, in common with so many other artists, whether in brick, stone, stained glass, or paint.

Mr. Cole A. Adams, in seconding the motion, said he had looked forward with a great deal of pleasure to the paper, because he had recently had the advantage of reading Mr. Day's book on "Everyday Art," than which he had never read a more practical work. Mr. Day possessed that faculty upon which "A. K. H. B." gave a chapter in his "Recreations of a Country Parson," viz., "The Art of Putting Things." Mr. Day was a master in that art. In his paper Mr. Day had given expression to a feeling which was very rife at the present time, viz., that the time had come for a departure from strict and unreasoning adherence to precedents. It was beginning to be recognised that any man who intended to do good work, either in architecture or in decoration, must think for himself. It was not to be denied, he thought, that the position of a young artist who lived in any great period of art was a comparatively easy one to that of a young artist at the present time. The young artist of a great period in art was brought up in the school in which he lived,—whether that of the thirteenth century or the Renaissance. He imbibed the spirit of art with his mother's milk, and worked as a craftsman. But the young architect of the present day was perfectly bewildered in considering what he was to do. If he took up one style, he found, perhaps, that it was not in fashion,—that it would not bring him bread and cheese. If Mr. Day could suggest any course of study that should lead up to original thinking on the part of the student, it would be a great advantage. He wished it were possible to have amongst architects something similar to what prevailed amongst painters, viz., that some one or two men of acknowledged pre-eminence could gather about them "schools" or followings of students. But there were many difficulties in the way of doing this, for at the present time young architects were spread all over the country, and they had no particular master to lead them in a good course of study. He hoped that in time some true principles of study would be evolved. With such principles to guide them, he thought they could not fail to attain to better results, for they would have many minds intent on reaching the same goal instead of struggling to get to the four corners of the world, so to say.

The motion having been put to the meeting, and carried,

Mr. Day, in reply, said that many of Owen Jones's so-called "principles" were not principles at all: they were simply receipts, or working "tips." One great evil of present-day demands upon the ornamentist was that so many people wanted something like somebody else. Only the other day he was asked to design "something Aitchisony." Well, if people wanted "something Aitchisony," why did they not go to Mr. Aitchison for it? With regard to Mr. Stannus's query, he did not mean to say that the younger men were not to learn style; on the contrary, they must master it before they could do anything. But the teachers of the young men must use style only as a means of explaining and illustrating principles. It was because this was, as Mr. Stannus had said, an exceedingly analytic age, that architects and ornamentists were what they were. It would be very comfortable if they could look at the work of the old men without troubling their heads unduly about it. The demands of clients might make it pay "commercially," for architects to follow in with the latest craze, but that was not the pursuit of art. The art of the future must embody the spirit of a wise eclecticism. He hesitated to use the last word, because it seemed to affect some people as much as a red rag affected a bull.

THE WELLINGTON STATUE ON ITS WAY DOWN.

ON Wednesday morning last (in lieu of Tuesday, as at first arranged, in order to meet the convenience of the First Commissioner of Works, who was present) the work of lowering the colossal equestrian statue of the Duke of Wellington at Hyde Park Corner was commenced. It will probably be a month or five weeks before the horse and its rider reach the ground-level, the brickwork and masonry constituting the interior portion of the Archway being gradually removed from under them.

Before describing the *modus operandi* adopted for the lowering of the statue, we may recall the method employed for raising it. The Wellington Statue was raised to the top of Mr. Decimus Burton's triumphal arch at Hyde Park Corner at the end of September, 1846, as recorded in our volume for that year (p. 477). The conveyance of the statue from the studio of its sculptor, Wyatt, and its elevation to the top of the arch which it has for more than thirty-six years disfigured, was the work of only two days, as against the month or five weeks which will be occupied in getting it down to the ground-level. The dimensions of the statue, as given by Mr. Decimus Burton, shortly before it was hauled up, are,—"About 30 ft. high, 22 ft. long, and 8 ft. wide at the centre," its "weight, exclusive of the plinth, being about 40 tons."* Mr. Decimus Burton, protesting, as we had done a year previously,† against the disfigurement of his arch by planting upon it a crowning feature for which it never was designed, pointed out (*Builder*, 1846, p. 361) that the relative proportions of the building and the statue were "entirely inharmonious." After quoting the dimensions of the statue, as already stated, he went on to say "The building proposed as its pedestal is 67 ft. high, 62 ft. long, and 50 ft. wide at the centre,"—dimensions which, he urged, constituted "a mass too heavy to combine, satisfactorily, with a surmount composed of a single equestrian statue." However, in spite of, but amply justifying, all protests, the statue was raised to its ill-chosen pedestal, never, we hope, to be so absurdly treated again, for in itself it is, as we have previously said, worthy of a better fate. The carriage on which the statue was conveyed to the *locus in quo* was 24 ft. in length, the axles being 13 ft. 4 in. long, with a circumference of 30 in. The wheels, four in number, were 10 ft. in diameter, or 31 ft. 6 in. in circumference, and weighed 2 tons 6 cwt. each, or about 9 tons altogether. Twenty-nine of the heavy draught horses belonging to Mr. Goding, the brewer, were employed to draw the lumbering vehicle and its ponderous load, which proceeded on its way "amid drums, trumpets, and the shouts of a vast multitude of persons." The group was raised by means of strong 6-in. cables "fastened round each thigh of the horse," and these cables were hooked on to the blocks used in the ascent. Through these blocks, four in number,—triple-sheaved and expressly made for the occasion,—ran six ropes, also quite new, and made of the strongest yarn, each rope being calculated to carry ten tons. Upon the traversing platform above were four powerful crabs, worked by eight men each. The scaffolding, erected for the purpose by Mr. W. Ellis, under the direction of Mr. Wyatt, was, of itself, a wonderful work, being 115 ft. in height, and having taken 200 loads of timber in its construction, besides scaffold-poles and planks.* The height to which it was necessary to raise the statue was 74 ft., and thence it had to traverse a distance of 60 ft. to arrive at the pedestal prepared for its reception upon the crown of the arch. This pedestal was about 22 ft. long, and 9 ft. wide. The top of the pedestal consisted of Bramley Fall stone, 1 ft. 9 in. thick. The core was composed of brickwork, set in Roman cement, and faced with 6 in. ashlar-work in Portland stone. The pedestal was built directly on the top of a brickwork arch, three rings of bricks in thickness, set in Roman cement. The arch of coffered or panelled masonry, visible to those who passed beneath the structure, is some distance below the brickwork arch just mentioned. This brick arch was expressly built to carry the statue, and its removal will be a work of some difficulty, as that of the core of the pedestal has been, owing to the almost adamantine hardness which the cement has acquired. Cast to each foot of the horse is a square "tag," so to speak, about 3 in. thick, and 12 in. or 15 in. square. Through each of these tags a gun-metal bolt, 2¼ in. diameter, and 20 ft. long, was passed, and carried downwards through the pedestal and brick arch, being ultimately secured in the masonry below.

Having said thus much about the raising and fixing of the statue, we will briefly describe the method being adopted to get it down. The pedestal has been removed, but before this was done, at each of the four angles, and resting upon the substructure of the masonry abutments of the arch, a temporary pier of brickwork, 6 ft. 6 in. by 3 ft. 6 in., set in Portland cement, and about the same height as the pedestal, was erected. Upon these piers a pair of wrought-iron girders, 24 ft. long, was placed, one on each side of and parallel with the horse. These longitudinal girders are connected at each end by a transverse girder, 20 ft. long, the whole being well bolted together. (The longitudinal or longer girders are the lowermost ones, the end or transverse girders being placed upon and across the ends of the longer ones.) At the points of crossing the girders are very rigidly bolted together and stayed with massive angle-iron brackets and braces, the bolts being 1 in. thick. This was the more necessary, inasmuch as when the statue is being lifted by the hydraulic jacks, the longer girders are really suspended to the shorter ones, for it is against the projecting ends of the latter, as hereafter stated, that the jacks exert their lifting power. The longer girders have a total depth of 16 in., with a web of ½ in. plate, the flanges consisting of 5 in. by 5 in. by ½ in. angle-irons. The transverse girders are 15 in. deep, having an ½ in. web, and 4 in. by 4 in. by ½ in. angle-irons. This rectangular framework of girders serves as a basis on which rest numerous balks of timber, 12 in. square, some placed transversely, and others longitudinally. Between these timbers and the belly of the horse is a massive trussing of timber, holding the group in position, assisted by shores raking downwards and outwards from the top of the cradle-like structure in which

* Mr. Burton in another place speaks of the statue as "about 27 ft. high." The dimensions given us by the contractors are: height, 26 ft. 6 in. from horse's feet to top of hat; length from nose to tail of horse, 25 ft. 3 in.; height from feet to underside of belly, 8 ft.

† See *Builder*, vol. iii. (1845), p. 325.

* Some further details of the conveyance and lifting of the statue, accompanied by illustrations, will be found in the *Illustrated London News* for October 3, 1846.

the animal seems to be standing to timber balks secured to the tops by the iron girders. The following are some of the dimensions of the timbers: tranverse and longitudinal balks resting on iron girders, 12 in. by 12 in.; timbers used in trussing, 8 in. by 8 in., well strapped and bolted together; curb surrounding body of horse at stirrup level, 12 in. by 12 in.; raking struts, 6 in. by 6 in. These timbers were all introduced and built up before the pedestal was removed, the whole weight of the group being carried by them and the iron girders, which, in turn, are supported by the temporary brick piers already mentioned. The ends of the transverse iron girders project some 2 ft. or 3 ft. beyond the ends of the longitudinal girders, and underneath each of the projecting ends is one of Tangye's hydraulic jacks, each, of course, having for its bearing the solid walls of the substructure of the archway, and each capable of sustaining a weight of 20 tons. It will readily be understood from what we have said that, first of all, the temporary brick piers, and then the masonry below them will be gradually removed, the statue gradually following in their wake,—the demolition of the interior portion of the archway and the lowering of the statue advancing, in fact, *pari passu*, so that when, as it is hoped, the statue reaches the ground in safety, the interior of the archway will have disappeared.

Since this account was written the contractors have favoured us with some additional particulars. The principle adopted by them is, they say, similar to that for lifting the Britannia tubes, except that the process is reversed, weight having to be lowered instead of raised, but the leading features of the apparatus are identical, viz., hydraulic rams for the motive power, and thin wood packings for every inch in the descent of the statue. The pedestal on which the statue stood having to be removed to allow the descent of the statue, it was necessary to have points of support outside. Brickwork in cement, the full height of the pedestal, has been built at each end of the framework on the old walls which carry the panelled or lower arch over the roadway, as well as the upper arch bearing the pedestal and statue. On this brickwork was laid a rectangular frame of wrought-iron riveted girders rigidly bolted together, the two end girders projecting beyond the frame, and resting on the top of a hydraulic ram, as well as on the top of a 1-in. hard wood packing on the half width of the brickwork, which was stepped down about 2 ft. to allow of the introduction of the ram. On the iron girders are fixed framed trusses, fitted with felt packings to the underside of the horse to take the weight. A timber frame or curb is fixed at the level of the stirrups, the whole being rigidly strutted and bolted to the frame of iron girders. The weight of the statue being then borne by the girders, the pedestal was cut away from beneath it by hammer and chisel, and this proved an extremely tedious job; the stones on which the horse's feet stood, weighing 12 tons, were removed, and the holding-down bolts, which went down 20 ft. into the brickwork, were cut off; and the statue, supported alone by the framing, resting on wood packing on the brickwork, was then ready for lowering. The half width of the brickwork on which there was no wood packing was then removed for 3 in. in depth, and three pieces of 1-in. hard wood packing inserted before commencing to work the pumps of the hydraulic rams. The rams at one end of the statue having been set to work, and that end of the statue raised clear of the packing, the remaining half of the 3-in. course of brickwork was then cleared off, and the word given to lower, and as the girders and statue descended gradually, the 1-in. wood packings were removed singly until in a few seconds the framework again rested on a single wood packing. The process was then repeated at the other end of the statue, and thus the horse and its rider are to descend to earth by a series of slow movements. The rams have all been tested to twenty tons each, and the girders and rams severely weighted before being fixed on the arch. The lowering operations will be continued as fast as the arches and middle walls can be cut away, until the statue is landed on the ground, leaving the outer or main walls of the building intact, which, with the masonry itself, will be taken down by two powerful steam cranes. The principle of the apparatus is very simple, though the woodwork and strutting looks somewhat massive and complicated, but the contractors wisely preferred to have a reserve of strength. The iron frame and details of the apparatus have been designed and superintended by Mr. F. T. Reade, A.-M.I.C.E.

The operations of Wednesday last resulted in the lowering of the statue about 6 ft. Before it can be lowered any more the upper arch has to be cut away. This will take some days. The operations are being directed by Mr. Reade, assisted by Mr. George Burt, of the firm of John Mowlem & Co., the contractors, by Mr. W. C. Morey, the foreman in charge of the work, and by Mr. Springthorpe, the foreman of masons. The iron girders used were supplied by Messrs. Rownson, Drew, & Co.

WORK IN BIRMINGHAM.

SIR,—The building trade here is only moderately busy this winter, and the prospect for the coming summer is not very rosy; still, there are several works in hand of considerable importance.

The new Gas Offices and Art-Gallery and Museum, completing the Council-house block, are well in hand. The masonry is up to the springing of the ground-floor windows; and as the whole building is covered by a steam travelling crane, its progress will, doubtless, be rapid.

The new parish offices in Newhall-street and Edmund-street are also well out of the ground, and masonry is being set all around. This building also is served by a steam traveller, covering the whole area.

The twenty-seventh new Board school, situated in Icknield-street, beyond the Mint, has just been opened by the vice-president of the Council. The site was formerly occupied by the Hockley Pool, which was filled up years ago, and put in the market as good building land. An area of about 3,507 square yards of this land having been acquired, at a cost of about 4,400*l.*, a school to accommodate 870 children has been erected, on the class-room system,—that is, one large hall for lectures, &c., to hold the whole of the scholars, and class-rooms surrounding the same, of an equal capacity in the aggregate. The cost of the building, with fittings, &c., has been 10,700*l.* Its principal feature is a tower, surmounted by a slated spire, square on plan, having small square spirelets rising at each angle of its base. The walls are of brick, with terra-cotta ornament, and the roofs, which are cut up into every variety of form, are covered with red tiles, topped by red ridges and finials. Generally this school resembles in style each of the twenty-six which has preceded it from the same hand, every part of it having a kaleidoscopic character, the same bricks, ridge-tiles, finials, roofing-tiles, cast-iron coping to walls, &c., only varied in position.

The same characteristics are seen in the new School Board offices in Edmund-street, now approaching completion. This, however, has a frontage entirely of stone, and is situated between two other public buildings. The details of this front are similar to those of the Midland Institute front, a kind of Victorian Gothic in style, with a projecting stone portico at entrance. A very funny thing about this portico is that its sides are carried up as crocketed buttresses against the building above, as if it required their support.

There is another attempt at a portico by the same hand in High-street, where two massive granite circular pillars support inverted carved brackets, between which springs a flat receding segmental arch. It looks as though they lacked stone enough to form a canopy, and is sure to provoke a smile. Two more Board Schools are progress, and the accommodation is said to be yet so insufficient, that three more still are projected. It is to be hoped the School Board will invite fresh architectural blood for these; the repetition has become monotonous.

The School Board rate for 1883 will amount to 54,000*l.*, or 8½d. in the pound; that for the last year being 48,000*l.*, or 7½d. in the pound.

The new Colonnade in New-street, on the site of the old Post-office, is completed, and the upper part has been opened as an hotel. The entrance is in New-street, having shops on either side, and gives access to the hotel above and the shops, some thirty in number, forming the Colonnade, which resembles very much those of Chester and other old places where there is a covered walk open on one side to the street, with shops on the other side. The building above is supported all round by square granite pillars and stone arches from which depend gaseliers, which, when alight, give a very pleasing effect. Altogether this building, which is Renaissance and faced all round with stone richly carved and surmounted with lofty Mansard roofs and turrets, is a very handsome structure. At the corner of Cannon-street and New-street, some old shops have been demolished, and a new stone-fronted block of the same design as the *Daily Post* block is being erected.

The new building in Corporation-street for the County Court has at last been completed and opened for business. It is in the Classical style, and looks a good and handsome building. It was opened just before that sharp nip of cold weather in December, and the arrangements for warming the building being nearly *nil*, and the draughts very cutting, the judge was obliged to hear the causes wrapped up in furs and rugs, and the barristers to plead in overcoats and shawls, with the result that one elderly barrister has since died from the cold thus taken. The barristers appealed to the judge, and his honour appealed to the Lord Chancellor, who, in his turn, appealed to the Board of Works, which has graciously sent down two small stoves. We must now await the next spell of frost, to test the efficiency of the new arrangements.

A large block of building is also going up next the new covered market at Smithfield, with frontages to Moat-lane, St. Martin's-lane, and Jamaica-row. This block is of brick, with red terra-cotta dressings, and lofty chimneys with Mansard roofs and gables, and is generally of the style of Queen Anne. The greater part of this building when complete is to be used as an hotel in place of the old Woolpack Hotel, now pulled down.

Nearly the whole of the ground to be occupied by the extended New-street Station is now cleared, and the excavations are well advanced. About seventy yards of the tunnel on the west is to be removed, and an open cutting substituted, and a similar opening out is to be made in the eastern tunnel. For that purpose the King's Arms Hotel and many other houses in Worcester-street are being demolished.

A remarkably rapid piece of building has lately been completed in the New Stork Hotel, Old-square. This has frontages to three streets, and the principal front of stone highly wrought, and is very lofty with Mansard roofs. This was built from beginning to end in about four months. Two other hotels are also built in Corporation-street, near the County Court, and a large block of offices is going up on land adjoining, which are intended to be occupied by lawyers, and to be called Lincoln's Inn. A new theatre is also projected to be built on land near Old-square, having frontages in Corporation-street and London 'Prentice-street, and is to be finished and opened next Christmas. From Old-square the new tramway to Aston starts. The cars began running on Boxing-day, and are drawn by steam locomotives. Much difference of opinion is being expressed as to the utility of using steam, but all seem to agree that the ride is cheap, quick, and comfortable. The fares are about one-half the amount formerly paid, and as a great many working people live at Aston, and the line terminates near the Aston Lower Grounds, which is a place of holiday resort for many, it is likely to be well used.

The Dawson Memorial Committee have accepted a model of a new statue to cost 800*l.*, and have authorised Mr. Williamson, of Esher, to proceed with the work. It is a standing figure, as the present one is, and is to be of marble. Whether this one, when in position, will not also suffer from the canopy remains to be seen.

That this committee, or any other requiring first-class sculpture, should go out of Birmingham for their figure, is felt by many to be a damaging reflection upon the School of Art and the Society of Artists. These institutions have now been in existence many years, and yet no sculpture worth the name is ever produced or exhibited. Acres of canvas are covered with paintings, good, bad, and indifferent, and yet no encouragement is given to modelling, with the result that when sculptors are wanted to model for the numerous art works in the town, they have to be sought elsewhere. The only room devoted to modelling at the School of Art is a small one in the cellar, and one seldom sees even a plaque in the exhibitions of the Society of Artists. In the new front of the Midland

Institute there are three empty niches for full-sized figures; in the new front to the Central Free Libraries there are three similar empty niches; and in the new Shakspeare Library there are two niches for busts also empty, and no effort seems likely to be made in the near future to fill them adequately. E. G.

SANITARY INSPECTION OF HOUSES.

AFTER the reading of the paper on this subject at the Society of Arts, to which we alluded in our last,

Mr. Robert Rawlinson, C.B., said he quite agreed with Mr. Burton that houses required careful examination, and if this had not been done recently, the chances are that they were in a bad condition. He spoke from experience of houses of all classes, from Windsor Castle down to common lodging-houses; and though what had been said was not new to him, there was abundant necessity for its being repeated incessantly. He often found that persons, though they acknowledged that their houses were defective in sanitary matters, yet shrank from the expense necessary to put them right. Such persons were, in his opinion, most foolish, for nothing was of any value compared to human life and health. If a man could only, by the greatest possible shifts, spare what was requisite to put his dwelling-house into proper order, he would, if he were wise, make the effort, because it was the foundation of the health of himself and his family. He was very sorry that, in many cases, the process was a very expensive one, though, when houses were properly built from the beginning, it would be very cheap. One principle which should never be departed from in the construction, whether of a palace or a cottage, was that no drain should be laid under any portion of the building. In London, where houses were built in streets, with the kitchen, scullery, and closet at the back, and the main sewer in front, it became necessary to drain under the houses; but, in such cases, cast-iron pipes with lead joints should be employed, with ventilation back and front, and thus any chance of sewer-gas entering the house might be avoided. Even the best stoneware pipes were liable to crack and leak at the joints. Another prevalent evil was, that the main sewers in some of the London parishes had not proper and safe junctions provided for the entrance of the house-drains, so that the sewer had to be broken into for the purpose, and very often a fine was also levied for entering the sewer, which was practically a premium to the builder not to connect the drains. This was the case with many houses in the west of London; and even when the connexion was made, it was not done properly, so as to prevent the inlet of air from the sewer into the house-drain.

Mr. Rogers Field said he found, from an experience of eight or ten years in these matters, that the majority of houses were very defective, and out of about a thousand he had examined, he had only found three which were sound. It was impossible to tell whether a stoneware drain was sound, without thoroughly testing it with water, and very few indeed would stand the test. In New York, the difficulty had now been so recognised of making good joints in such pipes, that a regulation was passed that all drains under houses should be of cast-iron, jointed in the same way as water or gas pipes. The sink-traps, which had been referred to, were a constant source of danger. Though defects in them were not always discovered without a careful examination, he was sorry to find they were still being constantly used, even in large houses.

Mr. E. P. Bailey-Denton said all sanitarians were agreed as to the mode of remedying the evils which had been described, and it only remained with the public to have the remedies carried out. One or two points he thought had been omitted; for instance, the danger from the waste-pipes of safes under water-closets and baths, and the great importance of disconnecting the house-drain from the sewer, had hardly been dwelt upon sufficiently; nor was the best method of ventilation sufficiently explained to make the public see the necessity for it. The flushing of drains was another point of importance. He agreed with Mr. Burton that the theories of sanitarians must not be pushed too far, and he would ask him whether there was not a possibility of falling into this danger, by insisting rigidly on an entire separation between the drinking-water cistern and the one for supplying the water-closet in cases where improved closets were used, the pipe supplying them being always full of water.

Mr. E. C. Robins said he could confirm everything said by Mr. Rogers Field as to the difficulty of laying stoneware drains perfectly; for he had never found one which would stand the test of water being put into it. He had used iron pipes, and had formed a subway under the house, in which all pipes were carried. With iron pipes properly leaded, both for drainage and ventilation, he had been able to dispense with traps altogether. Earthenware pipes required the very greatest care in laying, and yet, as a rule, builders employed common labourers for this work. Some employed bricklayers, and where great care was used, the result might be satisfactory. He agreed with Mr. Bailey-Denton as to the importance of flushing, and had been very much pleased with Mr. Rogers Field's syphon-apparatus for this purpose; it could be so arranged that, according to the rate at which the water was allowed to flow into it, the drains could be flushed twice or three times a day or oftener. The paper, though it contained nothing new, was very valuable, and the percentages given would be very useful.

Dr. Bartlett said there were other means besides those which had been mentioned by Mr. Burton for detecting the escape or presence of what was often called sewer-gas, but which he preferred to call sewer-air. Musk, for instance was not a gaseous body, and made its presence apparent by the diffusion of very minute particles; but there were other substances the detection of whose presence did not depend on the olfactory nerves, and about which there could not possibly be a mistake. If acetate of lithium were passed down a drain, its presence could be detected in the spectroscope by its characteristic line; tellurium, again, gave another definite indication. He had tried these two substances, putting them into the water supply, and detecting their presence in the sewers twenty minutes afterwards; and, on one occasion, on putting them into the sewers he detected their presence in the water supply in an hour and a quarter. He endorsed everything which had been said as to the importance of not admitting sewer-air into houses. He had seen a large building of the best description, in which there was the entire accumulation of six years, not one particle having passed into the sewer. The importance of disconnexion was not, he held, as new as some people supposed, the old fashioned method of a privy at the end of the garden being an exemplification of it. In many cases, the sewer was an elongated cesspool, and by the process of fermentation not only gaseous matters, but solid matters which were contagious as well as infectious, were carried into the house, and if they did not cause specific disease, caused that condition of lowered vitality which predisposed to every kind of disease.

Mr. William Botly said he had known, within a short period, two cases of typhoid fever arising from defective drainage, in houses of a rental of about 200*l.* per annum; and in a recent case, the stoppage in the pipes was occasioned by an accumulation of fat. There was nothing in the paper about compulsory inspection, but he considered that most important. Not long since, he saw a row of large houses, within the four-mile radius from Charing-cross, some of which had been occupied several times, although they were unconnected with the sewer. It ought to be compulsory on architects and builders to see that the connexion was properly made. In his native city, Salisbury, where great attention was paid to sanitation, the death-rate had been reduced from 27 to 17 per 1,000.

Mr. Collins said reflections were often made on architects with regard to these matters; but there were probably not more than 5 per cent. of the houses built which had the advantage, or disadvantage, of an architect's superintendence at all. He agreed that there was a difficulty in laying down stoneware drains satisfactorily, but it could be done; the greatest difficulty was to get the work properly carried out, and it could only be ensured by having some one to inspect its progress throughout. He had frequently found a most admirable system fail from defects in carrying out the work, and it was, therefore, very important to have a simple system which would admit of easy re-inspection. He had used Mr. Field's syphons very largely, but they were so powerful in action that they sometimes emptied the traps. This could easily be obviated by a practical man, and did not detract from the value of the syphon, but it required to be borne in mind. It had been said that there ought to be compulsory examination of every house, but it was already provided, by the Metropolis Local Management Act, that no house should be even inhabited until it had been certified by the surveyor of the parish. Being a Vestryman of Paddington, he had often tried to get this carried out, but the answer always was, that it would require too many clerks to carry it into execution. Another important matter was the financial question. A man would willingly spend 40*l.* or 50*l.* to put his house in order, but was deterred by the very large expense some specialists would put him to. He knew an instance of a public institution, where a difficulty occurred owing to the expense, which was estimated at 550*l.*, but he had all that was necessary done for 220*l.*

Mr. C. N. Cresswell said the technical part of the subject had been amply discussed; but there was a larger and important aspect of the question to be considered. How were the terrible mischiefs to be remedied? He was glad to see so many ladies present, for they were even more interested in this question than men. The evil was most rampant in the suburbs of London, where houses were increasing at the rate of tens of thousands a year. It had been said in that room, by men not given to exaggeration, that of these houses not 20 per cent. were fit for habitation. How was this great evil to be dealt with? Mr. Burton represented a most excellent institution, and there were most eminent men connected with it, but how could any society deal with so vast an evil? Whilst it was dealing with about 200 houses in a given area, houses were increased by thousands around them. It was perfectly clear to him that neither philanthropic nor commercial enterprise could deal with this matter properly; it was an affair of the State. The State had taught them, by the Act of 1875, and by the model by-laws issued from the Local Government Board, how to deal with the difficulty, and there was no necessity for further legislation. If the by-laws were only put into operation, and men were found able and willing to do it, and the ratepayers would find the money, there would be no difficulty; but there was the real pinch of the matter, the apathy of the public, and that love of buttoning up his breeches pocket which distinguished the British subject. The dictates of science could only be enforced by the arm of the law, compelling the ratepayer to do that which would conduce to his own good and that of his neighbour. It could only be carried out by the principle of local self-government; but there were two sides of the question, dealing respectively with houses already built, and with those about to be erected. They were informed, on high authority, that while it would cost perhaps 150*l.* to put an existing house of 200*l.* a year, full of defects, into a proper state, 50*l.* would cover the expense if it were done in the building. The only way of approaching the British subject was by showing him that it was worth his while to do what they all agreed was his duty, and as to the manner of doing which all competent authorities were also agreed. He believed this would be accomplished if an official certificate, sealed with the seal of the local authority, were given him, testifying to the healthworthy character of his house, as that would immediately increase the letting or saleable value of his house by the amount he had expended. This certificate should state what had been done, and contain on the back of it a plan of the drains, and, issuing from an independent local authority, would be regarded as an increment of value to the tenement in the hands of the owner.

Mr. Liggins said they were all much indebted to Mr. Burton, but the weak point in the paper was that it did not say where the requisite scientific knowledge was to be obtained, which would enable them to get defects in drains detected with certainty. When some of the finest buildings in London belonging to the Government were recently amongst the most defective, how could private individuals expect to get their work done properly? The Vestry of Kensington took up this subject very warmly some four years ago, but they found there were no clauses in the Act of Parliament sufficiently strong to enable their surveyors to carry out the rules which they made. If they could get such certificates as Mr. Cresswell had spoken of, no doubt these would be very valuable, but

under the present law it could not be done. Again, when they found experts differing on certain technical points, how could the public decide between them? He believed the evil was much exaggerated by sanitary engineers, and that water-closets and drains did not generally communicate with the drinking-water.

Mr. G. E. Mineard wished to say a few words from the builders' point of view. He had a copy of a report on a house which had been arranged on the system described by Mr. Burton, in which an expert suggested that the manhole should be closed, and the iron ventilating-pipe removed, and replaced by a common zinc ventilator. How, then, was it possible for a builder desirous of carrying out the best system, to do so? His own experience was, that the sewer-gas would come out at the place where Mr. Burton said the fresh air would go in; in fact, he tried that plan years ago, and found it a failure. The air going up through the soil-pipe must be met by the volume of water and sewage coming down, of 800 times its specific gravity, and any sane man must see that the current being reversed, it must blow out into the area. Every one who had written on this subject admitted that he could not tell at all times which way the air would be going. As for sanitary defects, there could be no doubt that there was room for improvement on every hand. He had seen drains taken up at Sandringham House in which he could lay his hand, and at Eastwell Park he had taken up one which was 18 in. thick with solid sewage, and yet that was supposed to have been put into proper sanitary condition within eight years, under the supervision of a first-rate sanitary expert. How, then, could the public know whom to apply to? He believed if any good were to be done they must have an Act of Parliament. First settle what was the best thing to be done, and then make everybody do it. At present all was confusion, and many of the sanitary engineers were grinding their own axes by frightening the public. He had had a bell-trap, with all its imperfections, prescribed by a surveyor, and had had within the last three months to connect safes with waste-pipes, by order of a surveyor. If the Board of Trade or any responsible body would undertake, for a certain fee, to indemnify him against others coming to upset what had been done under their supervision, he would willingly go in for it. At present a builder, however conscientious, had no safe guide, and consequently the public did not appreciate sanitary appliances. If the gentlemen who preached this doctrine would only build some sanitary houses, and invite builders to see what could be done, something might be learned; but at present, the whole thing was in a state of chaos.

The Chairman, in proposing a vote of thanks to Mr. Burton, said the result of the whole discussion was to show the great importance of thoroughly educating the public in the matter. He could not agree with the last speaker in wishing that a hard-and-fast rule should be laid down by Act of Parliament, for if that had been done eight or ten years ago they would have been much less advanced in sanitary matters than they were at present; and he did not think they had yet reached absolute perfection in sanitary science. He hoped they would still go on striving and educating themselves, perhaps by occasional failures, until they had obtained a higher degree of excellence.

The vote of thanks having been passed unanimously,

Mr. Burton briefly replied.

THE MODEL BY-LAWS.

MESSRS. KNIGHT & CO., of Fleet-street, have just brought out an annotated edition of the Model By-laws of the Local Government Board relating to the cleansing of privies, ashpits, &c., to nuisances, and to new streets and buildings. The book, which has numerous diagrams illustrative of the several requirements, seems a most useful one. The model clauses, owing to their legal phraseology, are admittedly somewhat cumbersome, and, in many respects, not so readily intelligible to the non-technical reader as could be desired. Any reliable work, therefore, explanatory of each clause can scarcely fail to prove of valuable assistance, not only to those members of local sanitary authorities who have to consider the subject of new by-laws for their district, but to all who are in any way interested in the healthfulness of the dwellings in a locality. The work is obviously one which will be of special value to the numerous officers of sanitary authorities, and likewise to architects and builders. For, not only are the various model clauses explained, but many points wherein difficulty is often experienced are dealt with. Thus the reason for not making regulations as to the height of habitable rooms is given, with the opinion of Sir Henry James and Sir Farrer Herschell on the subject; the question of depositing plans of new buildings permanently with Local Boards is discussed, though unfortunately there are as yet no means of definitely settling this vexed question; the popularly supposed need for waiting for the approval of the Local Board before commencing a building is explained away, and a variety of other points affecting all who have local interests are dwelt upon in a way that will be of advantage alike to the public and to the officers of Local Boards.

Another point which deserves special mention is that under the by-laws of most sanitary districts, the walls of new buildings are required to be built solid and entirely of incombustible materials, thus prohibiting the construction of hollow walls and of walls formed of half-timber work. In the book before us, these kinds of construction are each proposed to be regulated in a way that includes due regard both to stability and to danger of fire. Again, the question of the necessity for carrying party walls through and above the roofs of new buildings has been considered, and we are told that in the case of certain small houses, this requirement can be dispensed with. In the same way the usual requirements respecting parapets to the external side walls of detached buildings can be dispensed with under particular circumstances. Modified forms of the model by-laws upon these and other matters, all of which are said to have been authorised by the Local Government Board, are given at length for the use and consideration of the public.

The illustrations include, besides the prescribed thicknesses for the walls of new buildings and many useful diagrams about traps, drains, and water-closets, a number of capital lithographs of drawings by Mr. Rogers Field, M.I.C.E., explanatory of the drainage and drain ventilation of houses under various conditions.

The book altogether must be regarded as a valuable addition to the means of instructing the public upon the general principles of sanitary and sound house construction, and we hope they, as well as the various Sanitary Authorities, together with their surveyors and medical officers of health, will benefit from the information it affords.

NEW WEST ST. GILES'S CHURCH, EDINBURGH.

THIS church was opened for service on Sunday last. It has been built by public subscription, to enable Dr. Chalmers to carry out the restoration of the old Church of St. Giles. The edifice is a large one, accommodating 1,000 sitters, and built from plans by Messrs. Hardy & Wight, architects, Edinburgh, which were selected in competition by the Hon. Sec. of the Royal Institute of British Architects, Mr. J. Macvicar Anderson. The works, begun in February last, have latterly been hurriedly completed, leaving still some work unfinished.

The church is built with nave, aisles, and transepts in Decorated Gothic, of earlier period than that of the mother church. The architects, however, have made an adaptation of the details forming the stone crown, both in the exterior, at the junction of the tower and spire, and in the pulpit and its accessories within. The church has a good but rather low position, and the spire, which is about 170 ft. high, looks well over the Meadow's trees. The arrangements for the service are designed to suit the congregational convenience, and departure from the ordinary proportions of the parts gives the pulpit full command of the interior, so far as sittings are concerned; with the exception of about a dozen behind two aisle pillars, worshippers all face the pulpit.

The pulpit is of ornate design, and, with the screen of the organ-chamber behind, is executed in oak, with the mouldings, carving, crocketed ribs, pinnacles, and finials of Decorated Gothic; the whole having a well-posed figure of the Angel of the Resurrection as its crowning finial. The pulpit stands on a platform of its own, slightly raised over another in front, provided for the font and Communion-table. These platforms are paved with Belgian cement tiles, and approached by marble steps, and are inclosed with a low parapet of stone, with small returns in front and circular foliage panels,—symbolic of the Tree of Life. Throughout the exterior and interior a fair amount of sculpture is employed. The masonry of the edifice is of a superior description, the external rubble being chisel-bedded random coursing of Hailes stone, with dressings from Dalmeny. The internal arching is put together in the fine Oberwood stone, the pale grey of which contrasts finely with the red granite supports.

The church is heated with over 2,800 ft. of high-pressure hot-water pipe. Ventilation is secured by air-inlets below, and two wood exhaust ventilators in the roof, which is open-timbered, with hammer-beams resting on stone moulded corbel pillars,—the principal timbers being darkly stained. Fresh air (in winter) is admitted over a Shorland air-warming grate, which heats the vestibule of the tower.

The sum available after payment of site is 7,500*l.*, and the estimates accepted for the work fell considerably below that sum. Slight alterations have been, however, made in the original plan,—the session-house having been enlarged, to form a hall and Sunday school, holding about 250.

A very sweet-toned bell, 11 cwt., has been hung in the tower by Messrs. Warner, of London.

OBITUARY.

Mr. Richard Cockle Lucas, sculptor, died at his residence at Chilworth, near Southampton, on the 18th inst., in the eighty-third year of his age. At various periods of his career Mr. Lucas was intrusted with commissions to execute the statue of Dr. Isaac Watts, erected in the West-park of the poet's native town of Southampton; the statue of Sir Richard Hoare, in Salisbury Cathedral; the monument of the Countess de Salis, at Harlington; the Johnson statue, at Lichfield, &c., besides many minor works in Winchester Cathedral and other places.

M. Gustave Doré died in Paris on Tuesday last, from the effects of a chill on leaving a party on Friday night. He was only fifty years of age, and was building a house at the corner of the Parc Monceau. His works, or at least the later ones, are as well, if not better, known in London than in Paris.

M. Guillaume Geefs, the eminent Belgian sculptor, has just died in Brussels, aged 77. Among his principal works are the monument in the Place des Martyrs; the statues of General Belliard and Leopold I. at Brussels; the tomb of Malibran, and the statue of Leopold I. at Laeken; the statues of Rubens at Antwerp, of Grétry at Liège, &c.

PONTEFRACT NEW TOWN-HALL.

THE erection of a new town-hall for Pontefract is a marked improvement in this old Yorkshire town, of gabled houses, old inns, and narrow crooked streets. The style adopted is that of Queen Anne. The building is of brick, with Ancaster stone dressings. The principal entrance is surmounted by some fine carving with scrolls, bearing the words "Peace," "Plenty," "Honour," and "Virtue." The entrance-hall is laid in mosaic. To the right is a spacious stone staircase, leading to the assembly-hall, and to the left the offices of the chief constable, borough surveyor, &c. On the same floor is the council-chamber. At one end of the chamber is a mantelpiece, a good specimen of ancient wood-carving, which was removed from the old vicarage. The town clerk and his staff are accommodated next to the council-chamber, and a strong room for the borough records adjoins. The assembly-room is 81 ft. long, and 37 ft. wide. A balcony runs along the sides, and opposite the platform is a small gallery. The platform can be used for dramatic purposes and choir singing, the necessary retiring-rooms being situated in the rear. The room is lighted by two sunlights, each of 126 jets, and will seat about 750 persons. The cost of the site, building, and fittings will amount to nearly 10,000*l.* Messrs. Perkin & Bulmer, Leeds and Harrogate, are the architects; the building has been done by several contractors. The hall was recently opened by Earl Fitzwilliam with considerable ceremony.

THE BRADFORD CHIMNEY DISASTER.

THE Bradford Borough Coroner, Mr. J. G. Hutchinson, resumed the inquest* at the Bradford Town-hall on the 20th inst., on the bodies of the fifty-four persons who lost their lives by the fall of a chimney at Newlands Mill, Bradford, on the 28th of December.

Shepherd Lamb, the engineman at Messrs. Haley & Co.'s premises at Newlands Mill, and whose daughter worked as a ruler at the mills, said he had worked at the place more than ten years. For the past two or three years he had noticed cracks on the east and towards the south-east side of the stack, commencing about 6 yards from the base and extending to a height of 14 or 15 yards. About a week before Christmas he noticed a bulging in the outer case on one of the angles on the east side. When he returned to his work on the Wednesday morning after Christmas, he noticed that a portion of the outer case had come away. In the evening he saw that more of the outer case had gone. The chimney was leaning a little towards the east. He did not notice that there was a strong wind that night, and he did not see the chimney rocking. Shortly before eight o'clock on the following morning he saw another portion of the outer case fall. About 6 yards seemed to have fallen. He went into the engine-house, and five minutes after he had stopped the engine for the breakfast half-hour he heard a great noise. On rushing into the yard he saw a great cloud of dust and smoke, and when this had cleared away he saw that the chimney had fallen.

The Coroner: Who has had the control of the chimney?—There has been the steward, Mr. Francis Haley, whom I have seen there. I have seen him there whilst repairs have been executed to the chimney, and I suppose he would be giving orders respecting the chimney.

For the last ten years, to your knowledge, has there been any examination of the inner part of the chimney?—Not to my knowledge.

Have you seen to the cleaning of the flues?—Yes.

Did not you go into the flues?—It is ten years since I have been in them. My man cleaned them out. The main flues we cleaned out about every six years. It is about eighteen months since our flue was cleaned. Witness added that on the Wednesday night or Thursday morning he did not see any smoke coming out. When a portion of the mill fell, about twenty minutes before the chimney gave way, he did not feel any alarm, or he would have told his daughter. The cracks which he had noticed in the chimney were sufficiently wide to allow him to get his hand in edgeways when they were at their worst. The cracks had gradually become wider. He noticed that they got worse about a week or a fortnight before Christmas.

The inquiry was again adjourned.

INSPECTION OF NUISANCES.

IN order to carry out these duties efficiently nspectors will require to exercise great forbearance, tact, and good temper; sometimes technical objections will be raised to your proceedings; sometimes vexatious delays and evasions will occur in the fulfilment of your notices; nuisances which you were anxious to suppress may have eluded your authority, or advantages which you were desirous to realise have stood beyond your attainment. When you would force one person to refrain from tainting the general atmosphere with results of an offensive occupation,—where you would oblige another to see that his tenants are better housed than cattle, and that while he takes rent for lodging he shall not give fever as the equivalent, you will be often reminded of the rights of property, and of an Englishman's inviolable claim to do as he will with his own. With private affairs you interfere only when they become of public import, with private liberty only when it becomes a public encroachment. The manufacturer's chimney that eclipses the light with unbroken clouds of smoke, the melting-house that nauseates a neighbourhood, the slaughter-house that forms round itself a circle of dangerous diseases,—these surely are not private, but public affairs, and how much more justly may the neighbour appeal to you against each such nuisance as an interference with his privacy; against the smoke, the stink, the fever that bursts through each inlet of his dwelling, intrudes on him at every hour, disturbs the enjoyment, and shortens the duration of his life?

It might be an infraction of personal liberty to interfere with a proprietor's right to make offensive smells within the limits of his own tenement, and for his own separate inhalation, but surely it is still a greater infraction of personal liberty when the proprietor assumes what is equivalent to a sole possession of the atmosphere, and claims the right of diffusing through it some nauseous effluvium which others equally with himself are thus obliged to inhale.*

* See pp. 60, 90, *ante*.

LONDON WATER.

MR. CROOKES, F.R.S., Prof. Odling, and Dr. Meymott Tidy, in a report dated January 1, 1883, and just submitted to the president of the Local Government Board, say,—"We submit herewith the results of our analyses of the 161 samples of water collected by us during the month of December, on the days and at the times indicated, from the mains of the seven London water companies taking their supply from the Thames and the Lea. Of these 161 samples, the whole, without a single exception, were found to be bright, clear, and efficiently filtered. . . . . It will be seen that in respect of the aëration, colour, and freedom from turbidity, the condition of the water during the past month has been unexceptionable; while the proportion of organic matter has fallen somewhat below that usually met with at this period of the year."

It can scarcely be regarded as anything short of remarkable that experts, as a rule, find the results of examination precisely what are desired by their employers. Dr. Frankland reporting to the Registrar-General often gives a very different account of the waters reported on at the same time by the eminent analysts above named.

A NEW SYSTEM OF CHIMNEY CLEANING.

ACCORDING to a German technical journal a patent has been taken out by a Leipsic firm for a small steam-engine of 4-horse-power, by means of which a body of about 3,500 cubic feet of air is introduced into the chimney from beneath with such a pressure that the soot is driven upwards, and is received at the top of the chimney in a specially constructed appliance so that the inmates of the house are far less incommoded than is the case by the ordinary system. It is said that in twenty seconds the complete cleaning of a chimney can be effected. The cost of the machine is said to be about 275*l*., and three men are required to work it, so that it is a question whether any gain could result, from an economical point of view, from its introduction, as the charge for its use must be to some extent in proportion to its price.

HERTFORD CASTLE.

SIR,—"G. T. C." in his excellent paper on "Hertford Castle," which appeared in your pages,† has, probably from want of local knowledge, fallen into error. He says, "The Danes overran this part of England more than once, and the camp at Danesbury is probably their work."

I know Danesbury well, and I can positively assert that there is nothing whatever there which indicates it having been fortified. "G. T. C." has evidently allowed himself to be carried away by the name of the place. The estate formerly belonged to the Cuyler family, and on the death of General Sir Cornelius Cuyler, bart., in 1819, it was sold to Mr. William Blake. At that time it was known as St. John Lodge; but when Mr. Blake bought the estate he changed its name to Danesbury; not that the Danes ever had a bury there, but that it sounded better. This account I had from Mr. Blake's son, the late Mr. William John Blake, who died at Danesbury in 1875.

Seven miles north of Hertford is a place which for centuries has been known as Dane End. It was here, according to tradition, that the Danes were checked. No such thing. It is simply *Dene End*=the End of the Valley. Dane End is in the parish of Munden, which name itself signifies the safe or peaceful valley.

J. E. CUSSANS.

* From an Address to Inspectors of Nuisances, by Frederic Booker, C.S.I., Coventry.

† See *Builder*, vol. xliii., p. 819.

ENLARGING THE SCHOOL BOARD OFFICES.

SIR,—I have just heard that the School Board offices are to be enlarged, and that the original architect is not to be entrusted with the work.

Is it known why? Surely he is the proper person. A paragraph in the *Builder* might lead to some explanation. AN ARCHITECT.

HARDENING FLOORS.

I NOTICE in your last issue that a subscriber writes for information with respect to hardening floors, and may mention for his guidance that I have found Griffith's Floor Enamel to be the most successful paint, standing severe weather and rendering the floor perfectly impermeable in several hospitals I have been connected with. F. W. B.

SETTING A CHIMNEY UPRIGHT.

SIR,—I read in the *Builder*, some years since, an account of what, at the time, was considered a remarkable and clever feat, viz., setting a high chimney upright by means of chasing and wedging, &c., at the base. I could not help feeling forcibly struck by the crude and unsafe method, as I thought it, of dealing with such a difficulty. Since then, with increasing experience in construction (especially in masonry), my misgivings have increased likewise, and I cannot help asking myself the question, "How is it that such a serious task as setting a leaning chimney upright is left to 'Steeple Jacks'"? There are several reasons why a structure of the kind should lean over, viz., insufficient or improper foundations, inferior mortar for bedding the material, insufficient bond or through stones, and carrying up the work unevenly or without giving the work sufficient time to settle as the building progresses. If, from these or similar causes, the erection commences to lean, "does it appear reasonable that a remedy should be attempted by such means as those usually adopted by the class of men referred to? It does not seem to me feasible that a chimney-shaft of such enormous weight can retain its bond, while subjected to such a process as chasing and wedging from the base. If there is any one particular kind of work requiring more especially the thought, care, and attention of an experienced architect, surely this must be it. W. J. M.

FRAUDULENT GIFTS.

SIR,—We have read with very much pleasure the article, "Fraudulent Gifts and Commissions," in your issue of the 6th of January, to which our attention was called this day.

About two years ago we decided to abolish all commissions, presents, &c., and even subscriptions to bean-feasts and Christmas boxes. To make the decision definite and final, we had circulars printed, and sent them to all our customers, announcing our resolve, and requesting that no presents might be offered to any of our people. We certainly anticipated worse results in loss of business, &c., than we have found, though there is no doubt that we have lost a great deal that would otherwise have come to us, and we are quite sure that we are still suffering in many quarters; but, on the whole, we do not regret the action we have taken, and are quite resolved to carry it out, whatever the results may be. We should be delighted to assist in the formation of such a society as is suggested in your article. EWART & SON.

Miscellanea.

Leeds Church, near Maidstone.—A polished brass eagle lectern has lately been presented to the above church, by Mr. Wykeham Martin, of Leeds Castle. The style is fourteenth-century Gothic. It has a massive central shaft, with smaller ones acting as buttresses, filled in between with foliage. It was made by Messrs. Jones & Willis.

The Institute of Painters in Water Colours announce that on the completion of their new galleries in Piccadilly, they will establish a school for the instruction of students in water-colour painting. No elementary teaching will be given, however, and admission to the school will be by examination. The work of the school will be supervised by members of the Institute, in much the same way as the work of the Royal Academy students is directed by the Academicians.

The Chateau Scott, at Cannes, now occupied by Mr. Gladstone, was fully described in the *Builder* for April 17, 1880 (vol. xxxviii., pp. 472, 474), when we published a view and plan of the building.

The Old Law Courts.—The materials of this interesting structure were disposed of on Monday and Tuesday, and consisted of the internal fittings of the main buildings fronting St. Margaret's Church, including the Admiralty Court. The first day's sale realised 850*l*. On Tuesday the fittings of the Old Court of Queen's Bench, the Exchequer Court, the Exchequer Chamber, Common Pleas, Second Court Common Pleas, and the Probate Court, were disposed of. The last lot in the catalogue, which may be regarded as the most interesting and historical lot of the structure, consisting of the building itself, was withdrawn, having, it is stated, been disposed of by private contract, to be re-erected on a public recreation-ground on the south side of the Thames. The entire proceeds of the two days' sale was about 2,450*l*. The Court of Exchequer was used as the sale-room, and the auctioneer made the witness-box serve as his rostrum. A very unwonted and lively appearance the place presented on Tuesday, when there was some spirited bidding for the first lot of lead put up. Commencing at 70*l*., it was ultimately knocked down at 174*l*.

Cork Exhibition of Manufactures, Arts, Products, and Industries, 1883.—The project for holding this exhibition has now been fairly launched. It is intended to hold the exhibition on the present site of the Corn Exchange, in the city of Cork, and to open it in the first week of July. It will remain open for two months, or such longer time as may be deemed advisable by the executive committee. The primary objects sought by the promoters are: 1. The exhibition of articles manufactured in Ireland, and of raw materials,—mineral, vegetable, and animal,—produced in Ireland; 2. The exhibition of articles manufactured, and raw materials produced in other countries, which, in the opinion of the executive committee, may tend to the improvement of existing, or the development of new, industries in Ireland; 3. The exhibition of machinery suited to Irish industries, the machinery manufactured in Ireland being distinguished from that of other countries.

Mid-London Market Bill.—The promoters of this Bill have, through their solicitors, Messrs. Higginson & Vigers, written to the Clerk of the Metropolitan Board of Works to say that, having regard to the suggestion of the Duke of Bedford as to the enlargement of Covent-garden Market, they intend to withdraw their Bill for the forthcoming Session. The Duke's proposals appear, they say, meagre and unsatisfactory, but they ought to receive due consideration, that there may be an end to the present congested and discreditable state of the market. Should the present negotiations, opened by the Duke, come to no satisfactory result, the promoters of the Bill will be prepared to submit the plans of their project to the further consideration of the Board.

Explosion of a Gasometer in Glasgow.—On Saturday night last, about ten o'clock, one of the large gasometers belonging to the Corporation, situated in the Lilybank-road, exploded, injuring nine persons. The Royal Princess Theatre was plunged into darkness in the midst of a performance, but through the presence of mind of the manager, no panic ensued. The damage is estimated at 15,000*l*. Foul play is suspected. Mr. M'Roberts, the manager of Nobel's Explosives Company, Glasgow, has made an examination of the scene of the explosion on behalf of the City authorities, and has given it as his opinion that from the appearance of the "pitting" on the plates of the holder the explosion could not have been caused by any other explosive than dynamite.

Two Persons Suffocated through a Defective Flue. — Mr. Meggison, deputy-coroner for North Derbyshire, has concluded the inquest on the bodies of Caroline Smith and Hannah Bailey, domestic servants in the employment of the Rev. George Sadler, an Independent minister at Glossop, who were found dead in bed on Sunday morning, 7th inst., in strange circumstances. They went to bed on the Saturday evening in their usual health, but in the morning Mrs. Sadler found them both dead, and for many days the cause of death could not at all be accounted for. Medical evidence having been given, the jury found that death was caused by asphyxia, which was produced by the inhalation of the carbonic acid gas generated in the heating apparatus of the chapel, and admitted into the sleeping apartment through defective joinings in the chimney.

Fireproof Houses. — Messrs. Dennett & Ingle are not content to let pass an assertion in the *Observer* that it is hopeless to expect to find a building that is really fireproof. They write, "For more than twenty years we have been constructing fireproof floors, and they are to be found in the principal public and private buildings in the United Kingdom. Yet during that long period there is not an instance where one of the floors has succumbed to fire. This fact is well known to architects, but as some of your readers may not be acquainted with what has been done to insure the safety of buildings, it is possible that many doubts might arise, followed by serious consequences. Thus, for example, no less than eight acres of our work are to be found in St. Thomas's Hospital, and if the notion got abroad that it was not what it was represented to be, much anxiety must be endured by the patients. Then it is suggested in the article that the corridors of the New Courts of Justice may become a source of danger. All the vaultings of the corridors in the building have been constructed by us in our concrete (they are not of stone, as is stated, although they may appear so), and we are confident that if a fire arose in one of them, it could not pass upwards or downwards through the material. We are no less confident about the safety of the floors of the courts and offices, which are also on our system."

Lectures: Institution of Civil Engineers. The Council have arranged for the delivery, at the Institution, of a series of six lectures, on "The Applications of Electricity," on the under-mentioned Thursday evenings, at eight o'clock:—

Feb. 15th, "The Progress of Telegraphy," by Mr. W. H. Preece, F.R.S.; March 1st, "Telephones," by Sir Frederick Bramwell, F.R.S.; March 15th, "The Electrical Transmission and Storage of Power," by Dr. C. William Siemens, F.R.S.; April 5th, "Some Points in Electric Lighting," by Dr. J. Hopkinson, F.R.S.; April 19th, "Electricity Applied to Explosive Purposes," by Professor F. A. Abel, C.B.; May 3rd, "Electrical Units of Measurement," by Sir W. Thomson, F.R.S.

Dynes Hall, Essex.—This old Queen Anne mansion is having considerable alterations and additions made to it under the direction of Mr. John Birch, of John-street, Adelphi. The original mansion was built in 1575, during the reign of Queen Elizabeth, and the greater portion of it was pulled down and rebuilt by the Enyons during the reign of Queen Anne. The works have been entrusted to Mr. Harcourt Runnacles.

Monumental.—The trustees of the late Mr. R. H. Allan have entered into a contract with Mr. Harry Hems, sculptor, of Exeter, for a monument, from the design of Mr. Pritchett, architect, of Darlington. It is to be erected against the blank wall in the south transept of St. Cuthbert's Church, Darlington, which was built in 1375, to support the cracking tower. The monument will be of fine statuary marble, with a profusion of fourteenth-century detail and carving.

Iron.—Mr. E. W. Marfleet, who has recently removed from Coleman-street to Metropolitan-buildings, 63, Queen Victoria-street, has been appointed London agent for Messrs. De Leeuw & Philippsen, of Antwerp, for the sale of Belgian joists, riveted girders, flitch plates, and so on. Their new section-book contains over 800 sections of iron, &c., with the sizes and weights in English and French, and a separate table giving the safe distributed loads for rolled iron joists.

Furniture.—Messrs. Howard & Sons, of Berners-street, have issued a capital trade book, showing much variety in designs of bedroom and other furniture, with useful information as to the cost of furnishing. Parquet flooring also is well illustrated, and several specially designed interiors are given, a few of which are somewhat overdone. The book will be found useful.

Stained Glass.—The east window of Langham Church, near Colchester, has just been filled with Munich stained glass, representing Faith, Love, and Hope, the subject being taken from 1 Cor. xiii. 13, "The greatest of these is love." The artists are Messrs. Mayer & Co.

TENDERS

For reinstating and re-decorating after fire, the Cheshire Cheese public-house, corner of Addle-street and Philip-street, City, for Mr. Frederick Garner. Mr. Joseph G. Needham, architect, 1, Princes-street, Spitalfields:—

S. W. Hawkings (works to be measured and valued.)

For school-buildings, caretaker's house, outbuildings, and fences, at Croyland-road, Edmonton, for the Edmonton School Board. Mr. A. R. Barker, architect. Quantities by Messrs. J. S. Lee & Son:—

Dove Brothers	£11,500	0	0
Foster & Dicksee	11,319	0	0
Shaw	10,644	0	0
Patman Brothers	10,544	0	0
Johnston	10,324	14	2
Goddard & Sons	10,224	0	0
Adamson & Sons	10,072	0	0
Kilby	9,863	0	0
Uff	9,540	0	0
Wall	9,524	0	0
Horlock	9,500	0	0
Gardener	9,301	0	0
Tongue (accepted)	9,087	0	0

For alterations and additions to London and South-Western Bank (Poplar branch). Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

C. Everard	£1,339	0	0
R. Abraham	1,295	0	0
J. H. Cocks	1,270	0	0
G. Sharpe	1,270	0	0
W. Bangs & Co.	1,234	0	0
Atherton & Latta (accepted)	1,150	0	0

For erection of chimney-shaft in Skin Market-place, Southwark, for the Bower-Barff Rustless Iron Company (Limited):—

Thomas Watson, Dulwich	£245	0	0

For roads and sewers on the United Land Company's Bruce Grove Estate, Tottenham:—

J. Cardus	£4,480	0	0
Beadle Bros.	4,110	0	0
J. G. B. Marshall	4,078	0	0
M. J. Botterill	4,069	0	0
J. Jackson	3,783	0	0
Nowell & Robson	3,693	0	0
J. Jackson	3,555	0	0
T. Spurgeon	3,415	0	0
J. Bell	3,269	0	0
W. G. Harris	3,251	0	0
Strachan & Co.	3,200	0	0
J. Pizzey	3,150	0	0
J. E. Bloomfield	3,149	0	0
W. Nicholls	2,899	0	0
S. Saunders	2,853	0	0
E. & W. Iles (accepted)	2,825	0	0

For the conversion of Stamford House, Stoke Newington, into a Female Penitentiary. Messrs. R. H. Carpenter & B. Ingelow, architects. Mr. W. H. Barber, quantity-surveyor:—

		Old Materials.
Shillitoe	£11,300	£35
Booth & Sons	10,425	75
Dabbs	10,250	150
Bentley	10,134	50
Roberts	10,017	120
Ashby Bros.	9,695	10
Boyce	9,480	36
Grover	9,472	37

For the erection of two detached villa residences at Honor Oak, for Mr. E. P. Trenchard. Contract No. 3. Mr. W. Jervis, architect:—

M. Redman (accepted)	£2,075	0	0

For alterations and additions to the Nun's Head, Nunhead, for Mr. Frederick Johnson. Mr. W. H. Jervis, architect:—

Weaks (accepted)	£700	0	0

For building new Board Schools at Kenmont Gardens, Harrow-road. Mr. E. R. Robson, architect. Quantities by Mr. Charles W. Brooks:—

J. T. Chappell	£10,980	0	0
Stimpson & Co.	10,229	0	0
W. Downs	10,137	0	0
C. W. Reading	10,100	0	0
W. Oldrey	9,993	0	0
J. Grover	9,979	0	0
C. Cox	9,878	0	0
Atherton & Latta	9,500	0	0
C. Wall	9,390	0	0

For erection of new, and enlargement of present school buildings at Calvert-road. Mr. E. R. Robson, architect. Quantities by Mr. J. Thornton Green:—

J. R. Hunt	£7,678	0	0
W. Tongue	7,262	0	0
Atherton & Latta	7,250	0	0
Kirk & Randall	7,147	0	0
S. J. Jerrard	7,033	0	0
W. Oldrey	7,000	0	0
F. Johnson	6,913	0	0
C. Wall	6,695	0	0

For the erection of a house in the Albert Park, Abingdon, for Miss Evans. Mr. Edwin Dolby, architect:—

Walter, Oxford	£950	0	0
Clarke, Parkstone, Dorset	863	14	0
Davis, Banbury	815	0	0
Barret & Drew, Abingdon	805	0	0
Selby, Oxford	776	0	0
Dover, Oxford	750	0	0
Martin, Maidenhead	740	0	0
Sharman, Kingsland	728	0	0
Wheeler, Wantage	707	10	0
Williams, Abingdon	659	17	0
Buckle & Wheeler, Abingdon (accepted)	599	0	0

For the erection of stables, coachhouse, and other offices, at Hackbridge, Surrey, for Mr. A. H. Smee. Mr. Richard Creed, architect:—

Humphris, Sutton	£950	0	0
Stewart, Wallington	879	0	0

For the erection of boundary walls, Beechholme, Hull, for Mr. E. Leetham. Mr. R. Coulson, architect. Quantities by the architect:—

Excavator and Bricklayer.

M. Harper	£199	0	0
J. Fewster	195	0	0
J. Drury	193	0	0
A. J. Kelsey (accepted)	185	18	8

Mason.

Quibell & Peers	£45	15	0
F. Sweeting (accepted)	37	2	0

For the erection of additional buildings, and alterations at the present buildings at the headquarters of the Fire Brigade, Southwark Bridge-road, for the Metropolitan Board of Works. Quantities supplied by Messrs. Nixon & Raven :—

Webster	£28,693	0	0
Dixon	23,520	0	0
Patrick & Son	22,882	0	0
Martin, Wells, & Co.	22,800	0	0
Shurmur	22,734	0	0
H. Hart	22,370	0	0
Crockett	22,000	0	0
Dickenson	21,900	0	0
Greenwood	21,679	0	0
Kellett & Bentley	21,643	0	0
Mowlem & Co.	21,600	0	0
Laing & Son	21,100	0	0
Bentley	20,775	0	0
Hook	20,730	0	0
Stimpson & Co.	20,370	0	0

Accepted for Llandudno Pier Extension and Swimming Baths. B. Nelson, Llandudno, Architect and C.E. Quantities by the architect. Amended on second tendering :—

No. 1.—Smith & Co.	£2,486	0	0
No. 2.—Woodall	1,847	0	0
No. 2a.—Messrs. S. Woodall	2,316	0	0
No. 3.—Pritchard & Co.	1,650	0	0
No. 4.—Gradwell	2,655	0	0
No. 5.—Tanson & Co.	1,580	0	0
No. 6.—Shelley & Co.	2,100	0	0
Pritchard & Co., for completion of No. 1	2,246	15	0

For the sewering, paving, flagging, &c., of a number of streets for the South Stockton Local Board. Mr. S. E. Thorrold, C.E., surveyor :—

J. Tomlinson, South Stockton	£1,703	13	3
G. Robson, Newcastle-on-Tyne	1,600	8	11
W. Robinson, Stockton	1,444	9	6
T. Heatley, Stocktou	1,418	2	10
T. Hunt, Thornaby (accepted)	1,409	7	8

For the erection of a depôt for Messrs. Carter, Paterson, & Co., at Camberwell. Mr. William Eve, 10, Union-court, Old Broad-street, architect :—

Brown	£5,100	0	0
Adamson & Son	4,925	0	0
Higgs	4,696	0	0
Lawrence	4,634	0	0
Hall, Beddall, & Co.	4,594	0	0
Hubble & Trott	4,560	0	0
Harris & Wardrop	4,544	0	0
Colls & Sons	4,500	0	0
Downs, Hampton-street, Walworth-road (accepted)	4,477	0	0

For the erection of a depôt for Messrs. Carter, Paterson, & Co., Norbiton. Mr. William Eve, 10, Union-court, Old Broad-street, architect :—

Phillips (too late)	£3,621	0	0
Lawrence	3,125	0	0
Rowe	3,032	0	0
Brown	2,990	0	0
Hubble & Trott	2,945	0	0
Down	2,945	0	0
Colls & Sons	2,850	0	0
Harris & Wardrop	2,774	0	0
Higgs,* Loughborough Junction	2,696	0	0

* Accepted.

For the erection of a lecture-room, Stoke Newington. Mr. William Eve, 10, Union-court, Old Broad-street, architect :—

Devereux (too late)	£387	0	0
Hayworth	365	0	0
Whincop (too late)	348	0	0
Brown	335	0	0
Eary	330	0	0
Harris & Wardrop	316	0	0
Hubble & Trott,* Creek-rd., Deptford	307	10	0

* Accepted.

For the erection of additional stabling, Fulham, for Messrs. Carter, Paterson, & Co. Mr. William Eve, 10, Union-court, Old Broad-street, architect :—

Hall, Beddall, & Co.	£376	0	0
Harris & Wardrop	344	0	0
Eary	340	0	0
Bangs	339	0	0
Mears (too late)	335	0	0
Hubble & Trott	325	0	0
Brown	316	10	0
Phillips,* Disraeli-road, Putney	300	0	0

* Accepted.

For completing twenty-four houses, Caistor Park-road, West Ham, for Mr. T. A. Hickley. Messrs. Muggeridge & Powell, architects :—

Castle	£2,650	0	0!
Robey	2,013	0	0
Riddell	1,947	0	0
Burman	1,500	0	0
Fisher (accepted)	1,397	0	0
Curtis & Woodcraft	1,355	0	0
Richmond & Derrick	1,253	0	0!

For pulling down old buildings, and erecting on site five dwelling-houses and shops, at Lyndhurst, in the New Forest, Hants, for Mr. John Maxwell. T. A. Shelton, architect :—

Crook, Southampton (accepted).

For alterations and additions to the Pilot public-house, High-street, Deptford, including walnut shop front, corridor, and bar partitions, counter, ornamental glazing, tiles, mosaic paving, &c., for Mr. E. J. Rose. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied :—

W. Shurmur (accepted).

For completing two villas at Boxmoor, Herts, erecting boundary fences, &c. Mr. W. A. Fisher, architect, Hemel Hempstead :—

C. Monk, Two Waters (accepted) £350 0 0

TO CORRESPONDENTS.

W. M.—F. B.—C. Y.—T. H. B.—K. H.—B.—J. M.—D. & I.—C. J. I.—J. P. P.—A. M.—F. E.—W. T. H.—J. B. & Son.—M. & Co.—J. S.—L. B.—E. & Son.—W. S. M.—E. W. M.—E. C. R.—H. I.—W. H. J.—J. G. N.—J. J. T.—W. O.—E. D.—M. W. C. W.—F. R. C.—M. & S.—H. G. H. (next week).—F. C. (next week).

Correspondents should address the Editor, and *not* the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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